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Cooperative ECONOMIC INSECT REPORT

Issued by

PLANT PEST CONTROL DIVISION

AGRICULTURAL RESEARCH SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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Survey and Detection Operations
Plant Pest Control Division
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Volume 13 March 1, 1963 Number 9

COOPERATIVE ECONOMIC INSECT REPORT

HIGHLIGHTS

ALFALFA WEEVIL eggs present on alfalfa in Spalding, Paulding, Polk and Fulton Counties, Georgia; no larvae present as of February 21 in latter three counties. (p. 139). GREEN PEACH APHID appearing on alfalfa (p. 139), lettuce (p. 140) and annual plants (p. 141) in Arizona. Also heavy on chrysanthemums in area of Santa Cruz County, California. (p. 141).

CUTWORMS present in some alfalfa in Maricopa and Yuma Counties, Arizona, and causing serious damage to lawns in areas of Mohave and Maricopa Counties, Arizona. (p. 139).

POTATO PSYLLID damaged early potatoes locally in Iron County, Utah; and POPLAR PETIOLE GALL APHID moderate on cabbage roots and creating problems in areas of Hidalgo County, Texas. (p. 140).

EASTERN SUBTERRANEAN TERMITE winged forms collected locally in North Carolina and Rhode Island. (p. 143).

DETECTION

A LEAFHOPPER (Texananus gladius) reported for first time in California. (p. 141).

FORECASTS

Potential threat of CHINCH BUG exists in much of eastern and central Illinois. (p. 153). MEADOW SPITTLEBUG expected to be low generally in Illinois and Ohio in 1963. (p. 158). ALFALFA WEEVIL potential severe in Oregon and other Western States, as well as in the East. (pp. 161-163). Potential large population of BLISTER BEETLES present in Indiana. (p. 165).

SPECIAL REPORTS

Status of the Screw-worm in the Southwest. (p. 142).

Summary of Insect Conditions in the United States - 1962

Cereal and Forage Insects (continued from page 136, CEIR 13(8):2-22-63).
- Corn, Sorghum and Sugarcane Insects - (p. 144).
- Alfalfa, Clover, Sweetclover, Vetch and Bean Insects - (p. 155).
- Lawn, Pasture and Rangeland Insects - (p. 168).
- Soybean and Peanut Insects - (p. 171).
- Flax, Sunflower, Mustard and Safflower Insects - (p. 175).

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Reports in this issue are for week ending February 22, unless otherwise indicated.

WEATHER OF THE WEEK ENDING FEBRUARY 25

The week's weather was highly variable over the Nation, but most notable was a midweek cold snap east of the Rocky Mountains. Early period temperatures, which rose to near spring-like levels, cooled rapidly, lowering daily minima to new extremes at many stations from the Great Plains to the Atlantic coast. A 59° reading at St. Louis, Missouri, on the 20th, was lowered to 22° in 3 hours from the cold air influx. Record daily minima were set on 3 consecutive days ending the 23d, at Louisville, Kentucky. On the 22d, when Pellston, Michigan, had an icy -35° low, new records for the date were set from Albany, New York, to Little Rock, Arkansas, and Atlanta, Georgia, with 8°, beat its old reading by 11°.

By the end of the week, temperatures were again moderating over the eastern half of the Nation, but not nearly enough to keep weekly averages generally below normal. Departures ranged to over 12° below seasonal throughout much of the Ohio and Mississippi Valleys and the western Great Lakes. New England and Pennsylvania logged below-normal temperature averages for the 5th and 6th consecutive week, respectively.

Over the Far West, daily temperatures were mostly normal or above, and averages exceeded 6° above normal over a wide area from Canada to Mexico. Helena, Montana, registered the largest departure with 12° above normal. Daily maxima at Cut Bank, Montana, were near 50° on 6 days.

Precipitation throughout the Far West was mostly insignificant. However, measurable amounts were recorded in all sections of the Pacific Northwest and Idaho. Little snow fell and depths still remain at near record low levels. Crater Lake, Oregon, reported a 34-inch cover, lower than any previous February measurement in over 30 years of record. General, mostly light precipitation fell in Colorado and north-central New Mexico.

Very little moisture was received over the four-state area of Kansas, Missouri, Arkansas and Oklahoma. However, Texas received good rains on the 18th, as did all the Gulf States, from an offshore storm which went on to produce a severe squall line over the central Florida Peninsula on the 19th. Winds to 75 m.p.h. were reported from downtown St. Petersburg and airplanes were damaged by an unofficial tornado which hit the Lakeland Airport. As the system moved up the east coast, precipitation amounts were locally heavy and fell as snow in the interior mountain areas. Falls of 8 inches were common in the Appalachians of the Virginias, and Canaan Valley, West Virginia, had 19 inches on the ground on the 19th. In New England, the storm dropped from 5 to 14 inches in southern interior areas.

A similar storm system worked its way from the Gulf up the east coast area, producing rain and snow over the Mississippi and Ohio Valleys on the 23d and nearly all the Nation east of the Mississippi River on the 24th. Charleston, South Carolina, received 2.25 inches on the latter day. Periodic heavy snow squalls to the lee of the Great Lakes left up to 18 inches of new cover in western New York. End-of-the-week snow depths ranged up to 50 inches in Maine and to 40 inches locally at Norfolk, Connecticut. Watertown, New York, measured nearly 5 feet. (Summary supplied by U. S. Weather Bureau).

CEREAL AND FORAGE INSECTS

GRAIN APHIDS - OKLAHOMA - Populations of APPLE GRAIN APHID (Rhopalosiphum fitchii), ENGLISH GRAIN APHID (Macrosiphum avenae*) and CORN LEAF APHID (R. maidis) continue at very low levels. (Okla. Coop. Sur.). ARKANSAS - Surveys in Washington County, northwest, negative for common aphids generally found on winter small grains except for Macrosiphum avenae*, which ranged 1-5 per linear foot in oats that made good growth prior to cold weather. (Ark. Ins. Sur.).

GREENBUG (Schizaphis graminum*) - OKLAHOMA - Populations continue at noneconomic level throughout State; ranged 0-5 per linear foot. Negative findings still common in many areas. (Okla. Coop. Sur.).

SOUTHWESTERN CORN BORER (Zeadiatraea grandiosella) - ARKANSAS - Studies made in 5 Washington County fields show survival to February 12 was only 1.74 percent. (Ark. Ins. Sur.).

ALFALFA WEEVIL (Hypera postica) - GEORGIA - Eggs present in 15 of 100 stems examined in Spalding County. (Tippins). Eggs noted in alfalfa stems in Paulding, Polk and Fulton Counties. As of February 21, no larvae have been found. (Johnson).

GREEN PEACH APHID (Myzus persicae) - ARIZONA - Appearing on alfalfa and on many weeds surrounding alfalfa, especially in Yuma County; few appearing in Maricopa and Pinal Counties. (Ariz. Coop. Sur.).

PEA APHID (Acyrthosiphon pisum*) - NEW MEXICO - Only an occasional light infestation noted in alfalfa checked in Dona Ana County. (N. M. Coop. Rpt.). OKLAHOMA - Ranged 0-0.5 per square foot of crown area in Sequoyah County. (Okla. Coop. Sur.).

CUTWORMS - ARIZONA - Unspecified species present in some alfalfa in Maricopa and Yuma Counties. Causing serious injury to lawns in new housing projects in Kingman area, Mohave County; also injurious to many lawns in Maricopa County. (Ariz. Coop. Sur.).

VEGETABLE WEEVIL (Listroderes costirostris obliquus) - CALIFORNIA - Larvae medium in soil and roots of dichondra lawns in Wasco, Kern County. (Cal. Coop. Rpt.).

BLACK CUTWORM (Agrotis ipsilon) - CALIFORNIA - Populations of half-grown larvae medium in field of safflower in Brawley, Imperial County. (Cal. Coop. Rpt.).

FRUIT INSECTS

SIX-SPOTTED MITE (Eotetranychus sexmaculatus) - FLORIDA - Moderate on Litchi chinensis at Pahokee, Palm Beach County (Feb. 5). (Fla. Coop. Sur.).

TEXAS CITRUS MITE (Eutetranychus banksi) - FLORIDA - Moderate on Citrus sinensis at Bradenton, Manatee County (Feb. 11), and on Citrus sp. at Sarasota, Sarasota County (Feb. 13). (Fla. Coop. Sur.).

CITRUS RED MITE (Panonychus citri) - FLORIDA - Moderate on Citrus sp. at Sarasota, Sarasota County (Feb. 13). (Fla. Coop. Sur.).

CALIFORNIA RED SCALE (Aonidiella aurantii) - CALIFORNIA - Medium on dooryard lemon in San Jose, Santa Clara County. (Cal. Coop. Rpt.).

* See CEIR 13(5):84.

TRUCK CROP INSECTS

POTATO PSYLLID (Paratrioza cockerelli) - UTAH - Damaged 2 small fields of early potatoes at Newcastle, Iron County; resulted in complete loss of 8 acres of potatoes. (Knowlton, Hall).

POTATO TUBERWORM (Gnorimoschema operculella) - UTAH - No potatoes showing infestation found in areas of Washington, Iron, Millard and Beaver Counties, where infestations sometimes occurred in recent years. (Knowlton, Hall).

VEGETABLE WEEVIL (Listroderes costirostris obliquus) - CALIFORNIA - Heavy in mustard and turnip greens and roots in Modesto, Stanislaus County. (Cal. Coop. Rpt.).

CABBAGE APHID (Brevicoryne brassicae) - FLORIDA - Infested 2,500,000 cabbage plants at Bartow, Polk County (Feb. 5). (Fla. Coop. Sur.).

POPLAR PETIOLE GALL APHID (Pemphigus populitransversus) - TEXAS - Moderate populations on cabbage roots continue to create problems in widespread areas of Hidalgo County. (Texas Coop. Rpt., Espensen).

THRIPS - NEW MEXICO - Populations very low on onions in Dona Ana County. (N. M. Coop. Rpt.).

GREEN PEACH APHID (Myzus persicae) - ARIZONA - Few being reported on lettuce. (Ariz. Coop. Sur.).

BEET ARMYWORM (Spodoptera exigua) - ARIZONA - Injury to some lettuce continues. (Ariz. Coop. Sur.).

CABBAGE LOOPER (Trichoplusia ni) - ARIZONA - Continues to cause injury to some lettuce. (Ariz. Coop. Sur.).

FOREST, ORNAMENTAL AND SHADE TREE INSECTS

SOUTHERN PINE BEETLE (Dendroctonus frontalis) - TEXAS - Active broods found in scattered, lightning-struck trees in Hardin, Liberty, Polk, San Jacinto and Tyler Counties. No new multiple-tree infestations found. (Williamson).

BLACK TURPENTINE BEETLE (Dendroctonus terebrans) - TEXAS - Damage to loblolly and shortleaf pines reported on National Forest land in Trinity and southern Houston Counties. Logging and lightning contributing factors. Beetles continue to cause additional mortality around periphery of older, inactive D. frontalis infestations throughout epidemic area. (Williamson).

PINE BARK APHID (Pineus strobi) - NORTH CAROLINA - Heavy on sample of white pine collected by resident in Person County; 20 percent of pines bordering lawn affected. (Jones).

HICKORY SHUCKWORM (Laspeyresia caryana) - OKLAHOMA - Overwintering populations of 6, 16, 21, 22 and 25 percent recorded from pecan shucks collected in Garvin and Murray Counties. Percent infestations based on shucks equivalent to 100 nuts. (Okla. Coop. Sur.).

A BIRCH APHID (Euceraphis gillettei) - CALIFORNIA - Medium on alder trees in Santa Maria, Santa Barbara County. (Cal. Coop. Rpt.).

A JUNIPER TWIG MOTH (Periploca nigra) - CALIFORNIA - Larvae heavy in nursery stock of Juniperus sp. in Chula Vista, San Diego County. (Cal. Coop. Rpt.).

A STENOMID MOTH (Anteotricha manzanitae) - CALIFORNIA - This species and a tortricid (Amorbia sp.) present on leaves of manzanita in Vandenburg Military Reservation,

Santa Barbara County. (Cal. Coop. Rpt.).

CONIFER APHIDS (Cinara spp.) - CALIFORNIA - Cinara sp., near curvipes, heavy on Pinus canariensis, and Cinara sp. near ponderosae, heavy on specimen pines in Riverside, Riverside County. Cinara sp., near sibiricae, heavy on Juniperus chinensis torulosa in Capistrano Beach, Orange County. (Cal. Coop. Rpt.).

GREEN PEACH APHID (Myzus persicae) - CALIFORNIA - Heavy in chrysanthemum plantings in Watsonville, Santa Cruz County. Chrysanthemums in several areas severely affected by aphids this fall and winter. (Cal. Coop. Rpt.). ARIZONA - Appearing on roses and many annual plants in Phoenix and Mesa areas, Maricopa County. (Ariz. Coop. Sur.).

WHITEFLIES - FLORIDA - Odontaleyrodes rhododendri moderately infested Rhododendron sp. at Green Cove Springs, Clay County (Jan. 16). Det. by L. M. Russell. (Fla. Coop. Sur.). NORTH CAROLINA - Undetermined species infesting gardenia at a Dare County location. (Robertson).

A LEAFHOPPER (Texananus gladius) - CALIFORNIA - Nymphs and adults heavy on leaves of Saintpaulia sp. (African-violet) in private collection in Pomona, Los Angeles County. Collected October 2, 1962, by J. Manning and D. Estes. Det. by J. P. Kramer. This is a new State record. (Cal. Coop. Rpt.).

EUONYMUS SCALE (Unaspis euonymi) - OKLAHOMA - Light to moderate in Bryan and Washington Counties. (Okla. Coop. Sur.).

Coccids in Florida - Aspidiotus lataniae moderate on Ligustrum sp. at Tampa, Hillsborough County (Feb. 20). Ceroplastes floridensis ranged light to medium on Platycerium sp. at same location (Feb. 20). Fiorinia theae moderately infested Camellia sp. at Brooksville, Hernando County (Feb. 13), and at Tampa (Feb. 20). Pseudaonidia paeoniae was light on 1,000 Camellia japonica plants at Gainesville, Alachua County (Feb. 14). Phenacaspis cockerelli was moderate on 200 Strelitzia sp. at Tampa (Feb. 20). (Fla. Coop. Sur.).

AN ACARID MITE (Caloglyphus sp., near spinitarsus) - FLORIDA - Ranged moderate to severe on calladium corms at Winter Garden, Orange County (Feb. 6). (Fla. Coop. Sur.).

INSECTS AFFECTING MAN AND ANIMALS

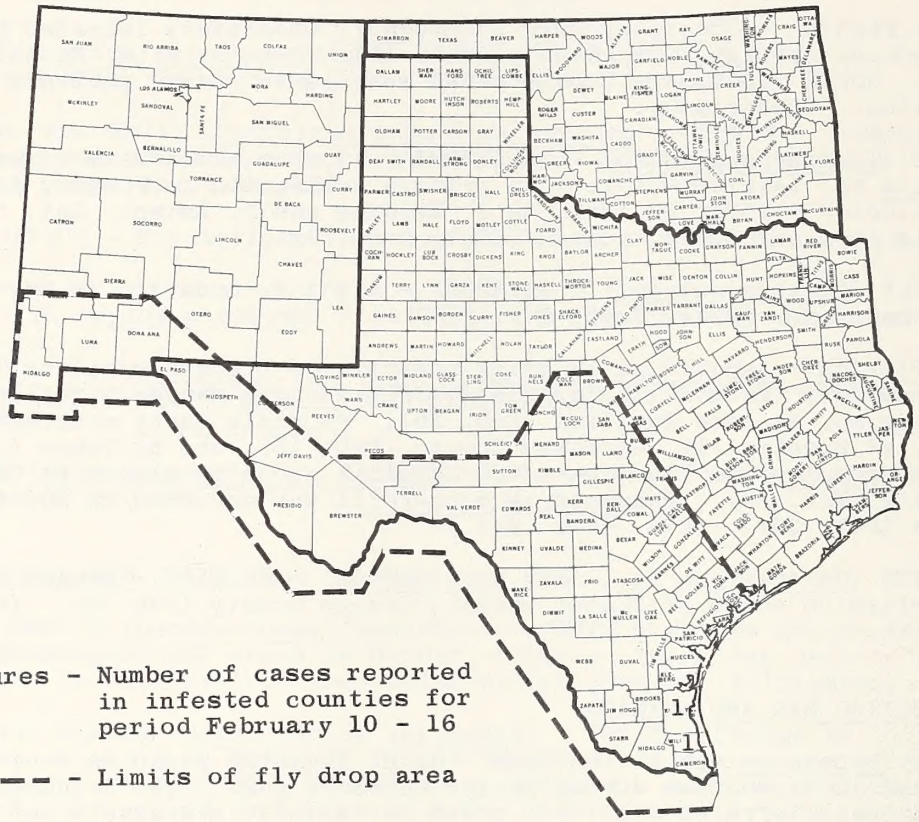
CATTLE GRUBS (Hypoderma spp.) - GEORGIA - No H. lineatum found on 6 of 14 cattle herds examined in 9 counties during period February 6-20. The 8 infested herds had 15-117 animals infested with 1-30 grubs per animal; averaged 4 per animal. (Roberts). OKLAHOMA - H. lineatum generally light to moderate, with few heavy infestations reported throughout State; 0-20 per head noted in Bryan County. Counts of 0-11 (average 4) per head recorded from yearling calves in Kay County; ranged 0-9 (average 2) per head in Payne County. (Okla. Coop. Sur.). UTAH - Hypoderma spp. grubs numerous in some cattle herds in Fremont-Loa area, Wayne County; moderate in some untreated cattle in northern Sanpete County; controls applied to 600 cattle in Kane County. (Knowlton).

SHEEP KED (Melophagus ovinus) - UTAH - Light on range sheep in western Millard County; much more numerous in farm flocks at Flowell. One range flock of 4,000 head treated after shearing last spring in western portion of county. (Knowlton).

STATUS OF THE SCREW-WORM (Cochliomyia hominivorax) IN THE SOUTHWEST

Specimens from only 2 infestations submitted for identification from Kenedy and Willacy Counties, Texas, during period February 10-16. This area receiving intense surveillance and additional sterile fly releases. The sterile fly barrier zone has been established and sterile flies are being released 25-50 miles into Mexico, and about 50 miles into those portions of Texas and New Mexico not receiving standard pattern of fly release

During the period February 10-16, a total of 69,422,500 sterile flies was released and only 2 screw-worm cases were submitted and confirmed. (Anim. Dis. Erad. Div.).



Figures - Number of cases reported in infested counties for period February 10 - 16

- - - - - Limits of fly drop area

CATTLE LICE - GEORGIA - During period February 6-20, examinations made of 14 herds in 9 counties consisting of 301 head of cattle. No lice found on 5 herds. On remaining 9 herds, infestations of Linognathus vituli ranged light to moderate, with most infestations light. Bovicola bovis light on cattle in Whitfield County. (Roberts). OKLAHOMA - Several species continue active over State, with light to heavy populations reported. Some buildup evident in Logan County. (Okla. Coop. Sur.). UTAH - Controls applied to 75 percent of cattle in Orderville area, Kane County, and to 50 percent of cattle in remainder of county. (Knowlton, Hatch). Controls applied to 7,000 cattle in eastern Millard County. Treatments applied to fewer cattle than usual in Delta area of Millard County and in Nephi-Levan area of Juab County to February 20. (Knowlton).

HOG LOUSE (Haematopinus suis) - OKLAHOMA - Continues active; infestations heavy in Cotton County, medium to heavy in Bryan and Stephens Counties. (Okla. Coop. Sur.).

HOUSEHOLD AND STRUCTURAL INSECTS

DRUGSTORE BEETLE (Stegobium paniceum) - OKLAHOMA - Causing some concern in few homes in Stillwater area, Payne County. (Okla. Coop. Sur.).

FURNITURE CARPET BEETLE (Anthrenus flavipes) - MARYLAND - Adults observed in home at Towson, Baltimore County. (U. Md., Ent. Dept.).

MEDITERRANEAN FLOUR MOTH (Anagasta kühniella) - OKLAHOMA - Causing concern in few homes in Stillwater area, Payne County. (Okla. Coop. Sur.).

INDIAN-MEAL MOTH (Plodia interpunctella) - MARYLAND - Larvae infested dogfood and other food in home at Baltimore. (U. Md., Ent. Dept.).

COCKROACHES - UTAH - Blatta orientalis a problem in several homes and public buildings in Delta area, Millard County. B. orientalis and Supella supellectilium infesting several homes and school buildings at Kanab and Orderville, Kane County. Several species a problem in homes and motels in Saint George-Santa Clara area, Washington County. (Knowlton). MARYLAND - S. supellectilium adults collected in home at Annapolis, Anne Arundel County. (U. Md., Ent. Dept.).

A PSYLLID (Pachypsylla celtidisvesicula) - OKLAHOMA - Reported very annoying at locality in Pawnee County; active on elm and hackberry. Activity also reported in Cushing area, Payne County. (Okla. Coop. Sur.).

A SPRINGTAIL (Entomobrya assuta) - NORTH CAROLINA - Found near bath tub and kitchen cabinets in home in Rowan County, February 10. Det. by D. L. Wray. (Jones).

CLOVER MITE (Bryobia praetiosa) - UTAH - Entered few homes in Iron County during recent warm weather. (Knowlton). NORTH CAROLINA - Caused some concern in Wake County. (Axtell, Cooper).

SUBTERRANEAN TERMITES - UTAH - Unspecified species damaging a hotel, a restaurant and a number of homes at Saint George, Washington County. (Knowlton). NORTH CAROLINA - Reticulitermes flavipes swarmed in basement in Wake County. (Cooper). RHODE ISLAND - R. flavipes alates collected indoors, Feb. 22, at Cranston.(Mathewson).

STORED-PRODUCT INSECTS

DRUGSTORE BEETLE (Stegobium paniceum) - CALIFORNIA - Larvae medium in chocolate in warehouse in Santa Maria, Santa Barbara County, and adults heavy in residence in Fort Bragg, Mendocino County. (Cal. Coop. Rpt.).

MISCELLANEOUS INSECTS

RING-LEGGED EARWIG (Euborellia annulipes) - NEW MEXICO - Present in dairy barn near Eunice, Lea County. (N. M. Coop. Rpt.).

LIGHT TRAP COLLECTIONS

FLORIDA, Gainesville (Feb. 20) - No collections of economic importance.

GEORGIA, Tifton (Feb. 14-20) - No collections.

SOUTH CAROLINA, Charleston (Feb. 11-17) - ARMYWORM (Pseudaletia unipuncta) - 3; FALL ARMYWORM (Laphygma frugiperda) - 4; BLACK CUTWORM (Agrotis ipsilon) - 1. Charleston (Feb. 18-24) - ARMYWORM - 3; YELLOW-STRIPED ARMYWORM (Prodenia ornithogalli) - 1; BLACK CUTWORM - 4.

SUMMARY OF INSECT CONDITIONS
(continued from page 136)

CEREAL AND FORAGE INSECTS (continued)

Corn, Sorghum and Sugarcane Insects

Highlights:

The EUROPEAN CORN BORER was more damaging in 1962 than in 1961 in North Dakota, South Dakota, Nebraska and Illinois, but less damaging in Pennsylvania, Delaware, and Maryland. Populations between these two areas were generally about the same as in 1961, with some shifting of population levels within the States reporting. SOUTHWESTERN CORN BORER was damaging in areas of Arizona, Texas, Louisiana and Arkansas, and new distribution records of the pest were recorded in Missouri, Tennessee, Mississippi and Louisiana. SUGARCANE BORER was practically eliminated from Louisiana by the January freeze. Relatively heavy CORN EARWORM populations were recorded in Ohio, Indiana and Wisconsin, but notable damage was limited to only a few areas. Corn earworm was also a problem in several southern and southwestern States. CORN ROOTWORM resistance problems spread to all areas of Nebraska and to some northern Kansas counties. Western corn rootworm was recorded in additional counties in Minnesota, Iowa and Missouri. CORN LEAF APHID was more abundant than 1961 in Wisconsin and Indiana; losses increased 4 percent in the latter State. TWO-SPOTTED SPIDER MITE was a problem in Colorado in 1962 on both corn and sorghum.

EUROPEAN CORN BORER (Ostrinia nubilalis) seasonal populations and development in NEBRASKA were about two weeks ahead of 1961. The spring carryover was low. The first generation was generally spotted; relatively high in some areas but low in others. The second generation built up to high numbers. Considerable stalk breakage was evident in the central area of Nebraska in August. Fall surveys in that State showed an average of 60.8 percent infestation and 201 borers per 100 plants as compared with 37.8 percent infestation and 55.5 borers per 100 plants in 1961 and 64.8 percent infestation and 135 borers per 100 plants in 1960. In SOUTH DAKOTA, the winter mortality survey showed an average mortality of 29 percent throughout the corn-growing regions of the State. The week of June 16-22 was the first indication of the adult stage being present in South Dakota, when 28 specimens were trapped in a blacklight trap at Brookings. In the east central region, egg mass counts ranged from 8 to 96 and averaged 46 on the first of July. At this time, 52 percent of the plants in Brookings County showed "shotholing", indicating that hatching was well underway. The first European corn borer pupa of the season were found on July 24 in Turner and Yankton Counties. Previous records show that there was a heavier infestation in 1962 than for the last few years. During the fall survey in South Dakota, observations in Turner, Hutchinson and Lake Counties showed a high percentage of plants broken off below the ear causing considerable losses. The State average for the percent of plants infested in 1962 was 39.6 compared with 58 in 1961, and the average number of borers per 100 stalks was 160.3 compared with 119 in 1961. The south central region of South Dakota had very low populations, probably due to heavy rains during the egg-laying stage and also during the first stages of larval growth.

Infestations of European corn borer were heavy in some fields in 5 extreme southeast NORTH DAKOTA counties. Mortality during the winter of 1961-62 was 31 percent. The 1962 fall survey showed 79 percent of the plants infested and 285 borers per 100 plants. In MINNESOTA, overwintering mortality in the spring of 1962 was the lowest in many years, averaging 16 percent. Cool and extremely wet weather in May and June delayed corn plantings; as a result, borer development was ahead of corn. Corn fields planted early had the highest numbers of borers. Late in June, corn 20 inches or more in height had the majority of egg masses and first-stage

larvae. First-generation European corn borer moth flights continued until the end of July. The southwest and west central districts of Minnesota had the highest populations of first-generation borers. There were, however, great variations in infestations between fields depending upon early or late plantings. The second-generation moth emergence started in late July and extended well into September. Second-stage larvae were found in a number of fields the first week of October. The fall abundance survey reflected the adverse weather conditions by showing a population drop in most districts. The west central and northwest districts showed the only increases. The following district counts of European corn borers per 100 plants were derived from the survey of 69 counties: Southwest - 92, south central - 34, southeast - 20, west central - 184, central - 30, east central-17, northwest - 90.

Moths of European corn borer began appearing in blacklight traps in Dane County, WISCONSIN, on May 15. The peak flight of the first generation occurred at about the same time as in 1961 although the magnitude was about half. Second-generation peak flight more closely coincided with that of 1961 in Wisconsin, and the fall larval infestation survey revealed fewer than the previous year. Investigations showed a near cessation of pupation in most counties after mid-August, and second and third-stage larvae were common in the lower tier of counties in September. The extent of injury was light in Wisconsin although sweet corn required extensive treatment in a few cases. Winter survival in ILLINOIS was about 75 percent. Populations were heavier than in 1961 and about the same as in 1960. The first-generation borer survey showed an average of 7 borers per 100 plants. The annual fall survey showed 102 borers per 100 plants. An estimated 129,226 acres were treated in Illinois. These treatments returned an estimated profit of $516,904 to the farmers.

European corn borer survival surveys in IOWA showed winter mortality to be 15.9 percent. Some damaging populations were present the latter part of June and, by mid-July, the borer was rated as an important pest. The first-brood survey showed an average of 36 percent of plants infested, with highest percentage (57) in the western half and northern third of Iowa. The number of borers per 100 plants averaged 58, with the highest number (77) in the eastern half and central third. Some second-brood moths were observed week ending July 20. The second-brood survey showed an average of 89 borers per 100 plants, with 64.2 percent of the plants infested. In KANSAS, there was a slight increase in European corn borer populations, but damage remained at a low level. European corn borer survival surveys that were made in early April in MISSOURI showed no reduction of overwintering larvae from 1961 fall counts in the southeast area and approximately a 20 percent reduction in the northwest area. The first pupa was observed (in cage) in the central area of the State the first week of May and the first pupa was observed in the field in the northwest area the week of May 14. High egg mass counts and a high incidence of leaf feeding by larvae were observed in the central and northern areas during the first brood. For some unknown reason, a high percent of the larvae never entered the stalks. Light to moderate European corn borer infestations were observed in susceptible fields in these areas of Missouri during the second brood. High populations of third-brood borers severely damaged late corn in the southeast area. This area had an average of 63.76 percent of the plants infested with 263 borers per 100 plants at the time of the fall survey. European corn borer surveys in ARKANSAS showed that there was little change in infestations when compared with 1961. There were three full generations in the State. In MISSISSIPPI, depredations remained about the same as in previous years. The European corn borer did not cause any measurable damage to corn in LOUISIANA, but the species is slowly spreading southward and westward.

European corn borer showed a general increase in borers per 100 plants in INDIANA, except for the far south where a decrease occurred. A localized, heavy infestation and moth flight occurred in Jasper County both in the first and second generations. A light trap operated at this location caught an average of 65 moths per night, May 28-June 4; 100 per night, June 5-11; 50 per night, July 10-17; and 100 per night, July 18-31. The fall corn survey in this same area revealed 52.7 percent infestation with an average of 87.3 borers per 100 plants. The overall

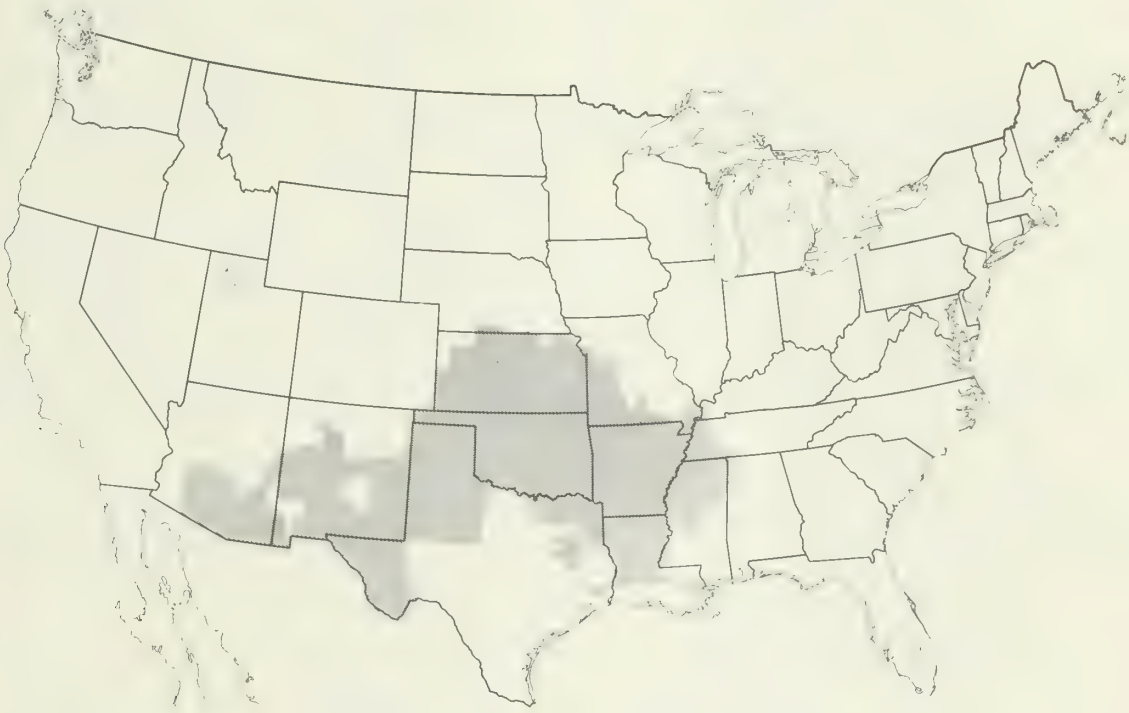
State average was 24.7 percent of the plants infested and 28.9 borers per 100 plants. The fall survey in MICHIGAN revealed that European corn borers were more numerous in the southern tiers of counties than further north. Even in most heavily infested areas, losses due to this insect in field corn were probably less than 3 percent in 1962. (This takes into consideration nutritional plant injury in addition to stalk breakage.) Borers averaged about 0.5 per stalk in the sampled area, or a 1.5 percent loss on a statewide basis. Apparently modern hybrids planted in Michigan have a high degree of European corn borer tolerance bred into them. Other factors such as soil type, weather conditions, fertilizer usage, plant population, hybrid selection and weed control appear far more important in corn production in Michigan than is borer control. European corn borer populations were very low in northwestern OHIO during midsummer, averaging about 2.3 larvae per 100 plants in Van Wert County. Fall populations were higher than in 1961, with the highest numbers being recorded in the northwestern counties. The borer caused less damage in PENNSYLVANIA than in 1961.

This borer required multiple treatments of sweet corn in the Hudson Valley of NEW YORK. Abundance normal; control good. First brood lighter then normal upstate. In VERMONT, there was a slight increase in overwintering larvae, but no extensive damage to corn was noted. European corn borer was moderately abundant in NEW HAMPSHIRE, with some noticeable increase in the second brood in the southern area. Light infestations and damage were reported in mid-July from Westbrook, Cumberland County, MAINE, and similar infestations and damage levels were noted in the Monmouth area, Kennebec County, and Orono area, Penobscot County, in August. In RHODE ISLAND, eggs were first noted in Kingston, Washington County, on June 22. Larvae caused early damage in occasional fields. European corn borer was regarded as unusually light in CONNECTICUT. Survival surveys in NEW JERSEY showed winter mortality to be 65.4 percent. Egg masses were noted June 7 in Middlesex County. In DELAWARE, the average of 138 borers per 100 plants found during the spring of 1962 indicated a high overwintering survival rate. Pupation of overwintering borers was first noted on April 3. The State average of 68 borers per 100 corn plants in the fall of 1962 represented an enormous decline in the population compared with 1961's 376 borers per 100 plants.

First-generation European born borer larval infestations in MARYLAND ranged from 9 to 61 percent in corn planted May 1 or earlier. Second-generation damage during July and early August was generally light. Adult activity reached a seasonal peak during the last week of August in Queen Annes County. The fall population survey showed borer numbers relatively low in Maryland, the State average being 59 per 100 plants, down 61 from 1961. Dry weather during July and August is probably the reason for the sharp decrease. In VIRGINIA, infestations in corn were statewide and severe infestations were reported in large fields of wheat in Westmoreland and Caroline Counties. European corn borer was recorded in Davie, Rowan and Stanly Counties, NORTH CAROLINA, during the year for the first time. Heavy infestations were present in Bibb County, GEORGIA. Several other Georgia counties were infested, but populations were lighter. For complete information on the fall European corn borer survey, see CEIR 13(3):33-40.

SOUTHWESTERN CORN BORER (*Zeadiatraea grandiosella*) was very heavy in ARIZONA grain sorghum in early October, especially those fields planted to sorghum in 1961. The borer caused heavy damage to corn and grain sorghum in the northeastern one-fourth of TEXAS, and caused more damage to corn in LOUISIANA than at any time since its appearance in 1955. Late plantings in the upland areas of the northern tier of Louisiana parishes were destroyed in many areas. This insect has now spread into 32 of the 64 Louisiana parishes. The infested area extends southward to highway 190 and eastward to the Mississippi River. For the third consecutive year, a survey of the percentages of corn lodged as a result of infestations was conducted in ARKANSAS. In 1962, 12.3 percent was lodged as compared with 10.9 percent and 5.8 percent in the previous two years, respectively. This species is regarded as more damaging than European corn borer in the State. There were three full generations of southwestern corn borer in Arkansas in 1962. A special survey of overwintering larvae was conducted. January 1962 had the coldest weather the State has had since the species entered the State. Lows of

-5 to -10 degrees F. were recorded. In some areas, heavy snow cover during the low temperatures appeared to protect the larvae. Percentage of survival was as follows: Northwest - 12.9; northeast - 6.1; southwest - 57.9; and west central - 43.8. Southwestern corn borer again was of economic importance in KANSAS only in a few fields in the southern areas. The insect was present in OKLAHOMA. This insect was recorded for the first time in Mississippi, Scott and Texas Counties, MISSOURI, in 1962. Damage to corn in the southwest area was about the same as in 1961. With the new records, all the counties in the "bootheel" area of southeast Missouri are infested. Severe damage to late corn was observed in this area in 1962. Several fields were 100 percent infested. The 1962 survey showed that the county average in the infested area ranged from 0.2 to 43.7 percent of the stalks girdled. In TENNESSEE, some new counties in the western area have been found infested. They are Gibson and Crockett. In addition, the following counties are also infested: Shelby, Tipton, Lauderdale, Dyer, Obion, Fayette, Haywood, Hardeman, Madison, McNairy and Hardin. Chester County is suspected of being infested. A survey in MISSISSIPPI during 1962 showed 38 counties to be infested. Damage also continues to increase in the State.



Distribution of Southwestern Corn Borer

LESSER CORNSTALK BORER (Elasmopalpus lignosellus) caused heavy, local damage to grain sorghum in Hidalgo County, TEXAS. This pest was generally distributed in low numbers in the northeast part of the State. Damage to corn was light to medium in Orange County, CALIFORNIA, and unusually heavy infestations were reported in MISSISSIPPI where corn and sorghum were damaged. It was also heavy on grain sorghum in GEORGIA.

STALK BORER (Papaipema nebris) excited great concern in RHODE ISLAND in July by its damage to corn. Light infestations were observed in several areas of Cumberland County, MAINE, causing light damage to corn. In VIRGINIA, stalk borer

occasionally infested corn in several areas. The borer returned to low population levels in INDIANA and was of little economic importance. Several rather heavy infestations of SOUTHERN CORNSTALK BORER (Diatraea crambidoides) were present in early corn in Kent and Sussex Counties, DELAWARE. This pest appears to be increasing during the past 2-3 years.

SUGARCANE BORER (Diatraea saccharalis) was virtually eliminated from LOUISIANA by the severe January freeze. Only a few fields in the extreme southern part of the State developed populations which justified insecticidal control measures. Sugarcane borer was heavy in Brazoria County, TEXAS, on grain sorghum, but generally light in other areas. Locally heavy infestations occurred on rice in Jackson County, Texas.

Localized outbreaks of ARMYWORM (Pseudaletia unipuncta) on sorghum and corn were reported from Northampton County, VIRGINIA, in mid-August. Damage to corn was also reported heavy on the Eastern Shore during an outbreak that occurred about May 15. Medium infestations were encountered on corn in Hanover County, Virginia. On April 25, a total of 111 adults was taken in the light trap at Painter, Accomack County; this was three times the largest catch taken on a comparable date since the trap survey began in 1958. This outbreak also extended into MARYLAND, where corn in Worcester County needed treatments. Heavy armyworm feeding was observed on grass and lower leaves of corn in grassy corn fields in ILLINOIS, but little damage was done to the corn. Armyworm caused some damage to corn in WISCONSIN and isolated, economic infestations of corn were observed in NORTH DAKOTA. Armyworm was relatively scarce in NEW HAMPSHIRE; a few adults were taken in blacklight traps the first week of November. It was not a problem in NEW YORK.

FALL ARMYWORM (Laphygma frugiperda) caused considerable "ragging" of late-planted grain sorghum in scattered, localized areas of OKLAHOMA. The first activity was reported in mid-July, with continued activity being observed until mid-October. In TEXAS, this pest was numerous and caused heavy damage to grain sorghum and corn ears over the eastern two-thirds of the State. However, fall armyworm was light on corn in MISSOURI and of minor importance in KANSAS. Populations in LOUISIANA, MISSISSIPPI, ALABAMA and GEORGIA were relatively heavy; light to heavy numbers were present on millet and grain sorghum in the latter State. In COLORADO, 40 percent of the corn plants in some southeastern fields were damaged. Moderate to heavy numbers were present in the western area of Colorado, but no controls were considered. Localized outbreaks were detected on corn and sorghum in mid-August in Northampton County, VIRGINIA, and infestations in late corn were spotty in MARYLAND, although infestations of over 50 percent of plants occurred in Frederick and Talbot Counties during August. Fall armyworm appeared in scattered groups of whorl-stage sweet corn in the Hudson Valley of NEW YORK, but almost no entries in ears. Low populations were present in INDIANA in 1962.

CORN EARWORM (Heliothis zea) infestations and injury were generally light in Cumberland County, MAINE; this is the only report of the pest in 1962 in the State. The insect was very scarce throughout NEW HAMPSHIRE, of little concern in RHODE ISLAND and much less abundant than usual on sweet corn in MASSACHUSETTS. Appearance was late in CONNECTICUT and not troublesome in treated fields. In NEW YORK, it appeared in tassels of sweet corn in June in the Hudson Valley and seemed likely to be abundant in summer and fall. Infestation of unsprayed ears was light in July and August. Cool conditions in summer resulted in prolonged subterranean or pupal periods of 4-5 weeks. Moth flights, beginning about August 25, caused moderate infestation in September. The infestation in July and August was controlled with sprays. Infestation developed after September 1 in western New York. Infestations in corn in MARYLAND were above normal during late August and September, and damage was statewide in VIRGINIA. It shattered whorls of field corn the second week of June in NORTH CAROLINA; 10 percent of plants in several east central counties were infested,but tassels were not high enough to be injured. Eggs, 3-5 per silk, were present on field corn in Columbus and Robeson Counties the last week of June, and early instars were common on ear tips the following week. Late instars pupated in southeastern counties the fourth week of July, but were primarily in the fourth stage in the east central area. It was a problem, as usual, on sweet corn in North Carolina. In GEORGIA, light to moderate infestations were present on grain sorghum and millet, and damage by corn earworm was about the same in MISSISSIPPI as in previous years.

Populations of corn earworm were so heavy on OHIO sweet corn that growers were unable to control the pest. Light to moderate damage was reported, especially on sweet corn. Economic losses in field corn could not be estimated with any degree of accuracy. In INDIANA, moths and larvae were generally scarce until late August as substantiated by both observation and light trap catches. A pronounced rise in late moth abundance suggested the possibility of an unusually heavy fall infestation in Indiana. Cold, rainy weather in early September reduced the seriousness of this problem except in corn that was silking at that time. Losses in Indiana were about double those of 1961, with the greatest increase in the southern part of the State. In WISCONSIN, adults of corn earworm were caught in insignificant numbers near Arlington during the second week of July for the last 2 years. Heavy larval infestations were observed in the area this past season earlier in the year and late season flights were much heavier than in 1961, as were late-season larval infestations. Treatments were necessary for sweet corn in the southern portion of Wisconsin where some fields had as high as 80 percent of the silks infested by the first week of September. Fields of late and midseason field corn contained above normal numbers of the pest, although the loss factor was insignificant.

Corn earworm was reported feeding in the whorls of corn in southeast MISSOURI during early May. Counts in corn during August in the northwest area showed that from 8 to 73 percent of the ears were infested. Infestations in NEBRASKA were very light during 1962 and damage to field corn and sorghum continued at a relatively low level in KANSAS. However, on sweet corn in the latter State, the pest was severe all during the season in the Sedgwick County area. No infestations occurred in early harvested sweet corn in northeast Kansas, but they were severe with almost 100 percent infestation in August and September. Corn earworm appeared a month earlier in OKLAHOMA than records show for the previous three years. First notations were made in southeast Oklahoma during the week of April 14 and activity continued into mid-October. By late June, 75 to 90 percent of the corn ears on plants were infested in the southeast, with high counts of 600 to 1,000 per 100 heads present in grain sorghum in late July. Moderate populations started to decline by mid-August in grain sorghum.

Corn earworm took its usual heavy toll of sweet and field corn in all areas of TEXAS, and infestations in grain sorghum heads were heavy in some fields in the north central, northwest, south plains and Brazos-Burleson-Milam County areas. Infestations in south central Texas were more widely distributed on grain sorghum, but generally less severe. Corn earworm was a problem on NEW MEXICO sweet corn. It caused severe damage, especially in southern counties. Trace numbers of corn earworm were present in southeast COLORADO and losses were light; however, moderate to heavy numbers were present in the western area, but no controls were considered. Corn earworm was present in trace numbers in northern and northeastern Colorado and caused little or no damage to corn.

Corn earworm infestations were light on untreated sweet corn in ARIZONA, but controls were very effective when applied. Numbers were below normal for the year in UTAH. Infestations in southern NEVADA were heavy as usual and above the 1961 levels in other areas of the State. In CALIFORNIA, corn earworm was persistant on field corn in many locations of the State late in 1962. Infestations ranged from light to medium in San Diego, Butte, Kern, Santa Barbara, Merced, Riverside and Monterey Counties. Damage to sweet corn in California was not as great as in 1961. Populations of corn earworm were high in OREGON, but below those observed in 1961 in the Hermiston area. Controls were effective. Abundance was normal or below elsewhere in Oregon and control good. Corn earworm apparently did not overwinter in the Columbia Basin of WASHINGTON and was more completely winter-killed in the Yakima Valley than usual. A survey revealed 100 percent mortality down to 3 inches of soil. Development was slow during the cool summer, with only one-seventh to one-tenth as many moths trapped by August 1 as for the same time of the previous three seasons. Many control programs in Washington were reduced or entirely deleted during midsummer.

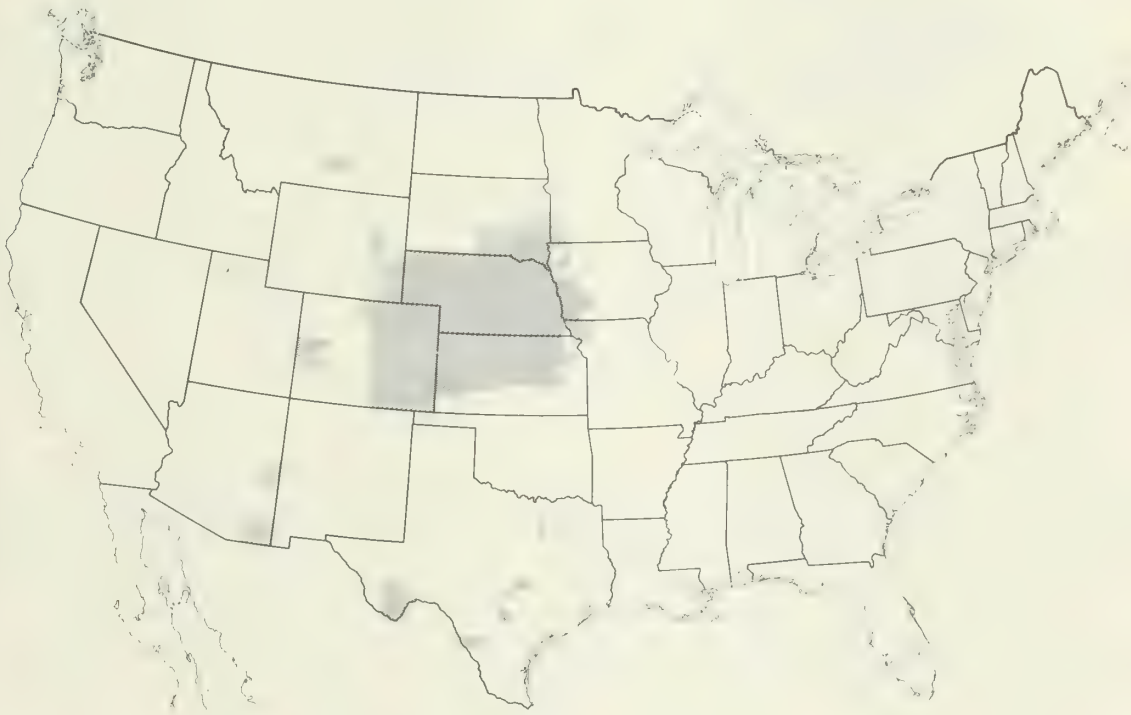
BLACK CUTWORM (Agrotis ipsilon) was lighter in 1962 than in 1961 in ILLINOIS, but many corn fields were severely damaged in the northern two-thirds of the State. An estimated 172,081 acres were treated thus saving farmers an estimated $860,405. Some losses to corn were caused by black cutworm in INDIANA early in the season. The cutworm was not of economic importance in KANSAS generally, but it was a problem on young corn in the eastern area of the State. Black cutworm was light in Lancaster County, NEBRASKA, corn in early July, and heavy populations occurred in milo, lentils and corn plantings locally in Butte County, CALIFORNIA. In MISSOURI, light black cutworm and DINGY CUTWORM (Feltia subgothica) infestations were first reported in corn in the northern and southeast areas in early May. These were isolated infestations in river and creek bottom fields, and persisted in areas until early July when corn in the north central area that had been delayed by drought was severely damaged by high numbers of cutworms. Several fields in this area of Missouri had to be replanted. By the end of July, parasites had reduced the populations until they were no longer a problem. WESTERN BEAN CUTWORM (Loxagrotis albicosta) caused minor damage to corn in the northwest district of KANSAS. Larvae of the NOCTUID (Simyra henrici) were found in small numbers feeding in 8.9 percent of the corn fields in northwest, west and west-southwest districts of ILLINOIS during July 22-27, and in 3.3 percent of the fields in the northeast and 10 percent of the fields in the east district July 30 to August 3.

SORGHUM WEBWORM (Celama sorghiella) infestations were generally noneconomic in TEXAS except for a few fields in the southern area where considerable damage resulted. Sorghum in most areas of Texas was nearing maturity when peak populations appeared and damage was relatively negligible. First observations in OKLAHOMA were made in late July with activity continuing through late September. Except for localized conditions, not much damage was inflicted. The webworm was noneconomic in KANSAS. Infestations of sorghum webworm in GEORGIA were light to moderate on sorghum and millet. CORN ROOT WEBWORM (Crambus caliginosellus) caused light, local damage to two fields and severe damage in a third field of seedling corn in Pittsylvania County, VIRGINIA. A BANDED WEBWORM (Thaumatopsis pectinifer) caused slight damage to corn on sandy soil during July in Antelope County, NEBRASKA.

WESTERN CORN ROOTWORM (Diabrotica virgifera), NORTHERN CORN ROOTWORM (D. longicornis) and SOUTHERN CORN ROOTWORM (D. undecimpunctata howardi) were all three present in NEBRASKA during 1962. Resistance problems spread to all areas of the State with the exception of the extreme western area. Populations and development were about 10 to 14 days ahead of 1961. The first larval damage was found in early June and continued through mid-August. First adult emergence was found in late June. Egg depostition occurred from late July to freezing temperatures. In SOUTH DAKOTA, the southern corn rootworm was first reported feeding on small grains during the first part of June. Populations at this time were low and no damage was observable. Southern corn rootworm was first found feeding on cucurbits toward the latter part of June. During the middle of July, Diabrotica spp. larvae were reported in Turner County, South Dakota, with populations of 10-12 per plant. The larvae ranged from first stage to fully grown. Some pupae were also found. In the month of August, adults of Diabrotica were very plentiful in the corn-growing region of the State, with counts as high as 40 per plant; southern corn rootworm, northern corn rootworm and western corn rootworm were all involved in the infestations. The three aforementioned species of Diabrotica were observed causing some lodging of corn plants in north central and northeast KANSAS. Chlorinated hydrocarbon-insecticide resistant rootworms were found in some of the northern Kansas counties. Larval damage by rootworms in MISSOURI was observed in untreated fields throughout the northern area of the State. The first pupa was observed in the northwest area the first week in July. From mid-July to early August, light to moderate populations of Diabrotica spp. were present on silks of corn throughout much of Missouri. Damage was also noted in IOWA during the year.

Western corn rootworm populations in WYOMING were found only in the southeastern corner of the State. Very light infestations were found in Goshen, Laramie and

Converse Counties. Platte County had the largest populations in Wyoming, 10 to 20 per corn plant, but little damage was found. After the first heavy frost, 700 to 800 beetles per 100 sweeps were found in alfalfa adjacent to corn fields. In MONTANA, western corn rootworm causes heavy damage where chemical control or rotation is not practiced. Infestations of economic importance are still confined to Yellowstone County. Populations of western corn rootworm were high in Montrose County, COLORADO, with 5 to 7 adults per 100 plants and controls used in some fields of corn. In northern and northeastern Colorado, the western corn rootworm has continued to be a problem requiring control at planting time in those fields where corn is planted year after year. Western corn rootworm was found again in Rock and Pipestone Counties, MINNESOTA, and in Nobles County for the first time. Populations were extremely low and accounted for only a small fraction of the rootworms present in the State. Western corn rootworm was recorded for first time in Cherokee, Pocahontas, O'Brien, Lyon and Plymouth Counties, IOWA, and in Atchison, Holt, Nodaway, Worth, Gentry, Andrew and De Kalb Counties, MISSOURI, during 1962.



Distribution of Western Corn Rootworm

Typical northern corn rootworm damage was less apparent in MINNESOTA than in 1961. This may have been due to increased use of soil insecticides and/or extremely wet weather. Larvae of northern corn rootworm stunted 20 percent of the corn plants in one out of six fields in west-southwest ILLINOIS, June 10-15. Adults were common and larval damage evident in many corn fields in the northwest, west and west-southwest districts of Illinois July 22-27. During July 30-August 3, adults were observed in 55 percent of the corn fields in northeast and 33.3 percent in the east district. They were commonly observed feeding on silks and ear tips throughout the northern half of Illinois August 12-17. In late August, adults were abundant in clover and alfalfa throughout the northern half of the State.

Northern corn rootworm is becoming more of a problem in INDIANA, especially where farmers are following a program of continuous corn. Losses in general were negligible in 1962, as growing conditions were good. Beetles feeding on corn silks were reported from a few counties. In OHIO, heavy adult populations of northern corn rootworm were found during a spittlebug survey in the northern area. Counts were 125-150 adults per 50 sweeps in late September. Severe damage to corn roots by larvae and barren ears produced by adults feeding were observed in several cases. Infestations of northern corn rootworm increased in southern MICHIGAN as more farmers went to continuous corn. No evidence of resistance to chlorinated hydrocarbon insecticides was observed, however. Northern corn rootworm was found feeding heavily on corn silks in north central PENNSYLVANIA.

Southern corn rootworm adults were found feeding on corn plants in the east central district of ILLINOIS May 20-25. Larvae caused some stunting and "goosenecking" of corn in 1962. The species was present on corn in INDIANA and common in OKLAHOMA.

CORN FLEA BEETLE (Chaetocnema pulicaria) was generally more abundant this past season in DELAWARE and caused noticeable feeding injury to young corn plants during early and mid-May. It was abundant and statewide by mid-July in Delaware. Some early damage to corn was also noted in PENNSYLVANIA and it infested some corn fields in southwestern ILLINOIS in late May with counts up to 6 adults on some plants. Damage to corn in Illinois was negligible, however. Corn flea beetle was light on corn in MISSOURI and of little importance in KANSAS. Infestations of DESERT CORN FLEA BEETLE (C. ectypa) were heavier than usual in young corn and sorghum throughout ARIZONA in April, May and June; counts of 5-10 adults per stalk were common in many fields. About normal numbers of desert corn flea beetle were present in UTAH. Unspecified species of FLEA BEETLES were a problem on sweet corn in several areas of NEW MEXICO and were very abundant on sweet corn in PENNSYLVANIA, but were light on corn and other crops except potatos in CONNECTICUT. Corn flea beetle required no control in NEW YORK'S Hudson Valley.

BLACK BLISTER BEETLE (Epicauta pennsylvanica) was very common in ILLINOIS corn fields during August. Feeding and cutting of silks from ear tips was noted, with 3-5 adults per ear tip common. Corn had pollinated, so no damage was done.

Damaging populations of unspecified WIREWORMS were present in INDIANA. In Montgomery County, a high population caused serious losses in a field of mixed corn and grain sorghum. SAND WIREWORM (Horistonotus uhlerii) and Melanotus spp. were light on corn in MISSOURI. Undetermined wireworms caused little damage to corn in ILLINOIS. Damage was observed May 20-25 in the southwest, but it did not exceed 0.5 percent in any field. Likewise, 0.6 percent of the plants were damaged in east-southeast district of Illinois. Wireworms caused local damage to seedling corn in some localities in VIRGINIA, and Melanotus spp. damaged seedling corn in Franklin and Windham Counties, VERMONT.

DUSKY SAP BEETLE (Carpophilus lugubris) was very heavy in field corn in DELAWARE during the first half of August and, during the summer, this species and some other sap beetles were somewhat below normal in ears and tassels of corn in all sections of MARYLAND. A SAP BEETLE (Stelidota geminata), in conjunction with other species of sap beetles, were occasional pests of sweet corn in VIRGINIA; and Carpophilus spp. were light on corn in MISSOURI and not serious in NEW YORK.

JAPANESE BEETLE (Popillia japonica) adults caused considerable concern in some parts of the Shenandoah Valley of VIRGINIA by feeding on corn silks. Damage was light in all instances, but a large number of acres was treated with insecticides. In MARYLAND, adults were more than usually abundant on silks of sweet and field corn in sections of Frederick, Montgomery and Queen Annes Counties. An infestation in Benton and Newton Counties, INDIANA, caused some damage to silks of corn. Feeding on corn silks in one heavily infested field reduced pollination on some ears to the extent of yield reduction of 25 percent. In RHODE ISLAND, heavy populations of Japanese beetle were found feeding on corn silks during the late summer.

MAIZE BILLBUG (Sphenophorus maidis) adults caused moderate injury to young sweet corn in Harford County, MARYLAND. Infestations of S. callosus were light to heavy on corn in GEORGIA, but much lighter than in previous years. In INDIANA, S. callosus continued to cause serious damage to corn plants in Montgomery County. The area is a muck soil area and is heavily infested with chufa (Cyperus esculentus), the preferred host plant of this billbug. Reduction of stand from this billbug feeding was about 25 percent, while 85 percent of the remaining corn plants showed typical leaf injury. Reports from St. Joseph and Decatur Counties, Indiana, indicated an abundance of the insect in those areas. Two other species of BILLBUGS (S. zeae and S. rectus) have also been collected and identified from Indiana. RICE WEEVIL (Sitophilus oryzae) damage in SOUTH CAROLINA is low due to widespread planting of resistant varieties. Some localized damage did occur, however.

Infestations of SORGHUM MIDGE (Contarinia sorghicola) in TEXAS were generally less severe in the eastern half of the State than in 1961 except in latest-planted fields where the damage was heavy. In the south plains area of Texas, infestations were rather general, but less severe in 1962 due to earlier plantings and preventive treatments in many areas. However, late-planted and nontreated sorghum in the area supported moderate to heavy populations and yield losses were significant. Infestations in ARIZONA were heavy in late-planted sorghum in Cochise and Graham Counties; however, there was a noticeable decline in the acreage of sorghum planted late. The insect was not picked up outside the five-county area infested in 1961.

A severe infestation of CORN BLOTCH LEAF MINER (Agromyza parvicornis) caused damage to sweet corn in the Canton area of Oxford County, MAINE. During June, populations of this insect were observed in corn scattered throughout MISSOURI. Counts ran as high as 2-8 miners per leaf. An unspecified species of LEAF MINER FLY heavily infested about 250 acres of field corn in Charles City County, VIRGINIA, in July. The foliage was also infested with a bacterium and uniform, heavy flecking was evident on the older foliage. The latter was possibly caused by a type of air pollution, probably ozone.

CHINCH BUG (Blissus leucopterus) infestations were less significant on grain sorghum in TEXAS than in 1961 or 1960. The species was present in OKLAHOMA and KANSAS, but at noneconomic levels. Moderate populations were present in Thayer County, NEBRASKA, corn in October, and light on corn in MISSOURI. Populations in ILLINOIS were generally low in corn and small grains, with very few fields needing treatment. However, populations were higher than in 1961. The annual survey shows a potential threat in much of eastern and central Illinois in 1963. In ALABAMA, several heavy populations were observed in the central and southern portions of the State. Millet was the prime target of this pest. Chinch bug was very light during 1962 on SOUTH CAROLINA sorghum. Medium infestations of the PLANT BUG (Largus cinctus californicus) occurred on corn in the Sacramento River district of Yolo County, CALIFORNIA. In addition, Lygus spp. were medium to heavy in field corn in Monterey County, California.

CORN LEAF APHID (Rhopalosiphum maidis) was light to heavy on CALIFORNIA sweet corn during the growing season, and light to heavy populations developed on field corn in Monterey and Santa Cruz Counties, same State. Infestations were rather severe in NEVADA, but below normal in UTAH. Infestations in WYOMING were much smaller than in 1961. The most serious ones occurred in Platte County where controls were applied to a few corn fields. In southeast COLORADO, corn leaf aphid was present on corn in trace numbers and losses were light. In some corn fields in northern and northeastern Colorado, the aphid infested 10 percent of the plants, but losses were negligible. The aphid was also present on sorghum at various population levels in Colorado, but in most cases did not appear to be at economic levels although controls were applied in a few instances. Also, corn leaf aphid was present on broomcorn in moderate numbers in the State and caused some discoloration and malformation of the brush on some varieties.

Corn leaf aphid was present on corn and sorghum in noneconomic numbers over much of KANSAS and did not reach economic levels in NORTH DAKOTA corn. The aphid was widespread on MINNESOTA corn, but the colony size was much smaller than in past years. Predation was generally high in 1962. The appearance of corn leaf aphid in WISCONSIN was about 2 weeks later than in 1961, but populations increased rapidly and were more abundant than during the past few years. Colonies appeared the second week of July. There was probably some correlation between these aphid numbers and poor kernel formation in fields examined in the fall. Corn leaf aphid again showed an increase over 1961 in INDIANA. Average infestations for the year showed a 4 percent increase, with the percent loss increasing from 3.0 in 1961 to 3.6 in 1962. Increases were apparent in the following regions of Indiana: North-northwest, north-northcentral, south central and south-southwest; decreases were significant in the southeast, south-southcentral and south-southeast. Corn leaf aphid lightly infested 17.8 percent of the corn fields in the northwest, west and west-southwest districts of ILLINOIS July 30-August 3. A general explosion occurred August 5-10, with winged aphids moving into 77.3 percent of the plants. Parasites, predators, disease and heavy rains effectively brought the infestation under control. Populations were generally light during the summer in MARYLAND, but some heavy infestations developed on late field corn in several counties. In VIRGINIA, corn leaf aphid heavily infested sorghum and some corn in Prince George County, but it was soon brought under control by predators. Small populations were noted locally in RHODE ISLAND, and the aphid was abundant on tassels of sweet corn in the Hudson Valley of NEW YORK in August, but was easily controlled on ears and seemed to disappear in September.

Corn leaf aphid attacked young grain sorghum in widely scattered areas of TEXAS, but most infestations were left uncontrolled and little yield reduction was noted as beneficial insects brought these infestations under control. Fall infestations in ARIZONA sorghum were heavy in combination with the RUSTY PLUM APHID (*Hysteroneura setariae*). Populations of the two aphids remained high until harvest. Rusty plum aphid does not occur in Yuma County, Arizona. In CALIFORNIA, *Rhopalosiphum fitchii-padi* complex was a pest of corn in several locations over the State.

Unspecified THRIPS were again abundant in MARYLAND and caused noticeable streaking on young corn. Unspecified species of thrips were also common in ILLINOIS corn, with up to 30 per leaf being counted June 3-8 in the west district. Considerable "silvering" occurred in this area in June and July.

TWO-SPOTTED SPIDER MITE (*Tetranychus telarius*) caused losses of 3 to 15 percent in corn in southeastern COLORADO. In the western area of Colorado, high populations of the mite caused considerable damage and there was an increase in the number of growers using controls for this pest. Two-spotted spider mite was also present on sorghum at various population levels in all fields of sorghum, but not economic in most cases. A few controls were applied, however. This mite appears to be infesting sorghum more each year in Colorado and could develop into a serious problem. In CALIFORNIA, two-spotted spider mite was light to medium on field corn in the delta region of Sacramento County and heavy on corn in the Watsonville area of Santa Cruz County. In IDAHO, two-spotted spider mite was controlled in some hybrid sweet corn seed fields in the southwestern area. Heavy infestations of SPIDER MITES (*Oligonychus* spp. and/or *Tetranychus* spp.) developed on corn in Churchill County, NEVADA, in August and September.

High populations of MILLIPEDS were present in corn fields in Saline, Seward, York and Hall Counties, NEBRASKA, during October.

Alfalfa, Clover, Sweetclover, Vetch and Bean Insects

Highlights:

PEA APHID caused considerable losses to alfalfa in Idaho, Washington and Oregon, but was generally not a problem in the other Western States. Pea aphid infestations in Texas constituted the most serious legume insect problem and early season infestations were damaging in Maryland and Delaware. SPOTTED ALFALFA APHID did not become the pest it was in previous years, but it migrated further north in 1962 than it had been known to do before. It was found in La Moure County, North Dakota, in June (a new State record) and penetrated South Dakota further than in any previous year. It was found again in Washington and Indiana, but late in the year. In Nebraska, the fall survey showed oviparous forms of spotted alfalfa aphid were present in a much larger area than in 1960 and 1961.

MEADOW SPITTLEBUG infestations ranged light to heavy in Pennsylvania and were a serious problem on alfalfa and clover in Indiana. The annual fall surveys in Illinois and Ohio indicated that populations would be lower in 1963 in those States. POTATO LEAFHOPPER caused severe yellowing of alfalfa in Wisconsin and continued to be one of the major insect pests in Indiana. Some yellowing was also reported in parts of Illinois and Missouri. Potato leafhopper reduced yields of alfalfa in Ohio and was exceptionally high in Vermont. Some yellowing was also evident in other Eastern States. LYGUS BUGS were a general pest in many of the Western States and controls were applied in numerous instances. TARNISHED PLANT BUG was numerous in several Eastern States.

ALFALFA WEEVIL continued to spread in areas where it occurs. An infestation was found in Vermont for the first time in 1962. Damage to alfalfa in the Northeast was quite severe in many instances, with dry weather complicating the condition. To a large degree, alfalfa weevil has contributed to the reduction of alfalfa production in Georgia. Populations in the Western States again caused considerable damage to alfalfa in Wyoming, Utah, Montana, Idaho, Oregon and Nevada. Alfalfa weevil was rated as the most damaging crop pest in Wyoming during 1962. Another weevil (Hypera brunneipennis) caused damage to alfalfa in parts of Arizona. SWEETCLOVER WEEVIL was recorded for the first time in New Mexico during 1962. CLOVER HEAD WEEVIL was heavy on white and crimson clover in Louisiana, and CLOVER SEED WEEVIL was a problem to control in Washington and Idaho because of the delayed emergence of adults.

ALFALFA LOOPER activity was extremely heavy in 1962 in areas of Montana, Wyoming, Idaho, Oregon, Utah and Nevada. Damage to alfalfa was sometimes rather heavy. ALFALFA CATERPILLAR was heavier than usual in Arizona and New Mexico in 1962. Damage continued into the fall months.

PEA APHID (Acyrthosiphon (Macrosiphum) pisum) populations began building up in IDAHO alfalfa in the Lewiston area during May, with population counts of 1-10 per sweep recorded during the remainder of that month. During early June, population counts fluctuated, running near one per sweep in the Moscow area to 20 per sweep at Lewiston. Meanwhile, populations remained below normal on alfalfa in the southern area of Idaho. By July, the population counts in southwestern area alfalfa began increasing, with 40 per sweep common, and by mid-July, controls were required in many fields in Canyon and Elmore Counties. By late July, more than 30,000 acres of second-cutting hay contained economic levels of aphids in Canyon County, Idaho, alone. These population levels were maintained until late August when counts declined rapidly. Most alfalfa in eastern Idaho never experienced a severe buildup, possibly due to adequate parasite-predator pressures. Pea aphid was extremely abundant on alfalfa in the Columbia Basin of WASHINGTON

where entire cuttings of hay were missed when control measures were improperly applied. In OREGON, populations in the Willamette Valley legume fields exceeded those observed in the past three years by July 28. A combination of high temperatures and predators contributed to lower infestations in early August. In Umatilla County, Oregon, pea aphid was an economic problem from early June, necessitating chemical controls in many instances. Over 2,000 acres of alfalfa required control measures during August in Klamath County. Elsewhere in Oregon, pea aphid was a normal, persistent pest. Infestations in CALIFORNIA were medium to heavy in the San Fernando and Antelope Valleys of Los Angeles County; medium in Yolo and Fresno Counties; light to medium in Monterey County; and generally light in Imperial, Orange and Siskiyou Counties on alfalfa. Below normal populations were present on vetch in Butte County. Infestations of pea aphid in NEVADA were generally below economic levels in the southern counties, except in alfalfa seed fields in April. Extremely heavy infestations in the central and northern counties of Nevada in July and early August were reduced primarily by hymenopterous parasites and, to a lesser extent, by predators. In ARIZONA, heavy infestations were present in alfalfa statewide during March and April.

Pea aphid populations in NEW MEXICO were much lighter than usual in most areas, probably due to unusually abundant populations of lady beetles, nabids, syrphid fly larvae and green lacewings. Normal numbers were reported from UTAH; and COLORADO populations were moderate to high, with the high populations occurring in the southeastern and western areas. In most cases, pea aphid was controlled by cutting alfalfa in Colorado. The most serious damage from this aphid in WYOMING occurred on second-cutting alfalfa. Populations were not as large as in 1961, with the largest populations occurring during late July and early August. Very light, nondamaging populations, ranging from one to 350 per sweep, were present throughout NEBRASKA on legumes. Pea aphid was present, but not in damaging numbers, in 1962 in KANSAS and NORTH DAKOTA.

Pea aphid infestations constituted the most serious legume insect problem in TEXAS, damaging clovers, field peas, vetch and alfalfa. The aphid was occasionally found in OKLAHOMA in overwintering alfalfa in early January. Counts remained light until early April when populations increased until heavy numbers caused damage from mid-April to mid-May, then populations declined and remained low throughout the season. Activity virtually ceased during August and September in Oklahoma, but very light populations were again evident in the southern part of the State in early October. The populations in April and May were heavier than usual. In MISSOURI, low populations of pea aphid were present during the early spring in fields of alfalfa and clover throughout the State. The high counts ran no more than 15 to 30 aphids per sweep and this insect never became a problem during the growing season. Infestations in ARKANSAS during the spring season were comparable with those of past years. Some stunting occurred, but practically no treatments were applied. Infestations in the fall were heavier than those of 1961, probably due to cooler and wetter weather.

Pea aphid populations were extremely high on alfalfa by late June and early July in all districts of MINNESOTA. Damage to alfalfa was not evident due to abundant rainfall and rapid plant growth the entire summer. Nymphs were observed on alfalfa in WISCONSIN from April to October 26. Winged forms were not found until the third week of May, about one week later than the previous year. Populations seldom reached the point where controls were needed in Wisconsin and were generally less of a problem than in 1961. Populations of pea aphid were low in ILLINOIS. A few legume fields had 500-600 aphids per sweep in mid-May. An estimated 11,585 acres of legumes were treated in 1962. Populations of pea aphid on MARYLAND alfalfa were above normal in all sections. During early May, numbers on the Eastern Shore ranged from 300 to over 1,000 per sweep. Populations were also heavy on crimson clover and vetch in southern Maryland. In DELAWARE, the first nymphs of the season were active on alfalfa by mid-March, and became fairly common by mid-April. Most noticeable injury occurred to alfalfa in Kent and Sussex Counties during early May and to several fields in New Castle County in mid-July. Pea aphid was very abundant on alfalfa in southern PENNSYLVANIA and,

although many predators were present in some cases, the aphid maintained its large population until harvest time. Pea aphid was also common on alfalfa and other legumes from May through September in RHODE ISLAND. It built up in late May and late July. Pea aphid was the predominant species of aphids on forage crops in a survey made during October in MASSACHUSETTS. Aphids comprised 63.8 percent of the total forage-crop insects collected. In NEW YORK, pea aphid was very abundant in Tompkins County in the spring, with a peak of about 600 per 10 sweeps. The aphids were relatively scarce during June and July, as is usually the case, but there was a rapid buildup of the population in early August to a peak of about 850 per 10 sweeps.

The three expected buildups of SPOTTED ALFALFA APHID (Therioaphis maculata) in the spring, summer and fall were light in all areas of ARIZONA, and damage from this insect was very low in 1962. Populations were unusually light in central and northern NEVADA. Infestations were heavy in Clark and southern Nye Counties in April and in seed fields in the latter county in July and August. Only trace to light populations were present in central Nevada in the late summer and fall, and none were found in the northern counties. Spotted alfalfa aphid varied considerably over CALIFORNIA. Some areas had few or no aphids this past season. The medium to heavy populations occurred in Los Angeles, Kern, Imperial, Butte, Shasta, Tulare, Riverside and San Bernardino Counties. Most of these infestations were local. Spotted alfalfa aphid was not a problem in OREGON during 1962, although light populations did appear in the alfalfa-growing areas previously infested. In WASHINGTON, light populations were first discovered in 1962 on alfalfa during October, as usual, in lower Benton County. Adults and nymphs became noticeable in IDAHO on new alfalfa seedings in western Canyon County in late August. Populations, however, remained low in these fields during the late summer and fall.

Winged forms of spotted alfalfa aphid were taken from alfalfa in June in La Moure County, NORTH DAKOTA. Populations were noneconomic. This is the first time the insect was found in the State. The first report of the aphid in SOUTH DAKOTA for 1962 was during the spring, on April 30, when a population of 4 per 100 sweeps was counted in Gregory County, indicating that this insect apparently overwintered in the State for the first time. The following week, population levels took a sizable leap to cause a little concern. At the middle of May, counts tended to decrease in South Dakota, probably due to the cold and wet weather. The first alate forms were found during the middle of July when the populations again showed a sharp increase and also when the insect started to migrate northward. The insect penetrated South Dakota further in 1962 than in any previous year. Its northernmost reported advance in the State was to the middle of Spink County. Checks were kept during the summer for oviparous forms of this aphid. The first oviparous female aphids were found October 8 in Charles Mix and Gregory Counties. The first and second nymphal stages were found in Howard County, NEBRASKA, on April 19. Counts of 1-40 per 10 sweeps occurred in north and central Nebraska in early May. Populations dropped considerably throughout June. First reports in southern and southwestern Nebraska occurred in late June. Through the remainder of the season, populations remained at a low level in most areas of the State. The fall survey showed oviparous forms were present in a much larger area of Nebraska than in 1960 and 1961. In KANSAS, a limited survey revealed the presence of the egg-laying form of spotted alfalfa aphid in Norton County; however, parthenogenic forms were only of minor importance over the State.

Occasional heavy infestations of spotted alfalfa aphid required controls in NEW MEXICO. Damage was much less severe statewide than it has been for several years, with the exception of 1961. Spotted alfalfa aphid was not a problem in TEXAS except in areas of Glasscock County, where heavy local damage occurred, although it was widely distributed over the State. Infestations in ARKANSAS were very low in general. Populations rose during dry weather in August, but later they declined. The first spotted alfalfa aphid of the season in OKLAHOMA was noted in the southeast in early February. By early March, populations began

to build up across the State until high populations were causing some damage to nonirrigated stands of alfalfa during April in the southwest. Populations declined and remained low until mid-July, when heavy infestations again caused sticky foliage in the southwest and west central areas. Populations remained low in Oklahoma on established plantings for the remainder of the year, but some damage was evident to newly planted fields in Kingfisher and Muskogee Counties in mid-October. By mid-November, however, these counts declined, but limited activity continued through December. Losses were minimal in Oklahoma considering the hot, dry conditions during the summer months. In the Arkansas Valley of COLORADO, spotted alfalfa aphid built up to 4,500 per 100 sweeps during August and, in some fields of newly planted alfalfa, seedling plants were killed. In other areas of Colorado, spotted alfalfa aphid did little or no damage. Populations were below normal for the year in UTAH.

Spotted alfalfa aphid was present in low numbers in alfalfa in the southern portion of MISSOURI during the late summer, but not of economic importance. For the sixth consecutive year, spotted alfalfa aphid was not successful in surviving the winter in INDIANA. Infestations were not found in the State until mid-September when the insect was collected in small numbers in Harrison, Floyd and Clark Counties. Winged forms were taken in the latter two areas.

CLOVER APHID (*Anuraphis bakeri*) increased rapidly to above economic levels during July in red clover seed fields in Canyon County, IDAHO. In some of these fields, population counts reached 400 per head. Clover aphid was considered abundant enough to require control in the northern Willamette Valley of OREGON during July.

Trace populations of GREEN PEACH APHID (*Myzus persicae*) developed on alfalfa in Fresno County, CALIFORNIA, and light populations were present in Siskiyou County, same State. In OREGON, the aphid was light in Klamath County. Hazard for infestations in 1963 is dependent on the severity of the winter. Green peach aphid built up in the Willamette Valley during July.

Light populations of soil MEALYBUGS occurred on alfalfa plantings in the Tyler Island area of CALIFORNIA, and they were heavy in some locations in the delta region. *Rhizoecus kondonis* infested alfalfa in the Clarksburg area of Yolo County, California.

MEADOW SPITTLEBUG (*Philaenus spumarius*) nymphs were first observed in DELAWARE on alfalfa in New Castle County during early May. Populations were generally much reduced over the previous year. Nymphal populations in MARYLAND were about normal and economic injury was caused to red clover in Frederick, Harford and Washington Counties. Meadow spittlebug was present in many areas of PENNSYLVANIA. Infestations ranged from light to very heavy. There is a gradual increase in spittlebug populations in recent years in the State, probably due to the inadequacy of alfalfa weevil (*Hypera postica*) treatments to control them and the general lessening of specific control measures. Spittle masses and nymphs were first noted May 24 in RHODE ISLAND and increased rapidly in forage legumes wherever present. Populations dwindled at the end of June and were not an economic problem. Meadow spittlebug comprised 1.9 percent of the total forage-crop insects during October in MASSACHUSETTS. Although meadow spittlebug populations were higher in NEW YORK than in 1961, only relatively low numbers of spittle masses, 1 to 2 per square foot, were noticed in Tompkins County.

Meadow spittlebug populations were lower than in previous years in OHIO, being at subeconomic levels except in the central and south central areas. The fall survey results indicated even lower populations in 1963. However, meadow spittlebug was again a serious insect problem on alfalfa and clover in INDIANA. It was most abundant in the southeastern counties. Each year infestations become of greater significance in the southwestern part of the State from Terre Haute to Evansville. They were higher in 1962 in this area than in previous years. In ILLINOIS, populations were light and continued the gradual decline of the past

few years. An estimated 9,356 acres were treated in 1962. The annual adult survey showed the lowest populations since the survey was started in 1951. The State average of adults per sweep was 0.82. Meadow spittlebug eggs began hatching in WISCONSIN about the first of May, a week earlier than in 1961. Populations rarely were heavy enough to warrant control in Wisconsin and, except for a few southern counties, were insignificant. Low populations were found this year in Houston, Fillmore, Mower, Freeborn, Olmsted, Winona and Goodhue Counties, MINNESOTA. Meadow spittlebug continued very abundant in alfalfa and clover fields in northern IDAHO during late spring and early summer. Counts of 10 nymphs per stem in alfalfa were not uncommon in Kootenai, Bonner and Boundary Counties.

THREE-CORNERED ALFALFA HOPPER (Spissistilus festinus) was heavy on alfalfa in ARIZONA from June through November in most areas. Damage from girdling was reported in several cases. Populations in NEW MEXICO remained about constant throughout the season; only minor damage was noted. The insect was normal in abundance and injury in UTAH. Peak populations in TEXAS occurred in late July and early November in the Brazos-Burleson County area, when considerable stem girdling was noted. In OKLAHOMA, the first activity of the season was noted in mid-June, but populations were not common until early September. Light activity continued in alfalfa until mid-December. The late summer-early fall populations were considerably reduced over 1961. Three-cornered alfalfa hopper caused local damage to alfalfa in SOUTH CAROLINA.

POTATO LEAFHOPPER (Empoasca fabae) adults were first caught this past season in WISCONSIN at Madison on May 15, 2 days later than in 1961. Numbers increased on alfalfa and severe yellowing was observed in scattered areas of the State. Generally, however, crops were harvested before more than half the leaves had dropped. In NEBRASKA, light populations were present on alfalfa throughout the season. Yellowing of alfalfa was found in scattered areas of the State. From late June to mid-July in MISSOURI, light populations were present in alfalfa throughout the State. During July and early August, populations of potato leafhopper increased in the north central and northeast areas of Missouri until yellowing was evident throughout these areas. Counts in alfalfa in the infested areas ranged from 15 to 50 per sweep. Populations of potato leafhopper in ILLINOIS were light, seldom exceeding 10 adults and nymphs per sweep. The one exception was an area covering parts of the west, west-southwest and central districts where populations ran as high as 60 adults and 188 nymphs per sweep in alfalfa in early July. At this time, 23 percent of the alfalfa fields in this area of Illinois showed some yellowing. Approximately 12,292 acres of alfalfa were treated in 1962. Potato leafhopper continued to be one of the major insect pests in INDIANA. On alfalfa and clover, there was considerable yellowing and stunting in July and August. Plantings of the new alfalfa variety, Culver, which was developed for insect resistance, showed very little damage from either potato leafhopper or meadow spittlebug in comparison with other varieties. Potato leafhopper was damaging to second and third cuttings of alfalfa over OHIO. This damage, combined with drought conditions, resulted in greatly reduced yields in many parts of the State. It was also damaging to clover in Ohio. The pest did not reach economic proportions in 1962 in PENNSYLVANIA, although some damage was evident in the northern section. Potato leafhopper was exceptionally high on alfalfa in VERMONT and was the second most abundant leafhopper on alfalfa in the eight MASSACHUSETTS counties surveyed in October. Populations of potato leafhopper in the Finger Lakes area of NEW YORK continued the trend of recent years toward lower numbers. In western New York and the Hudson Valley, populations were not great, but they did cause great damage when coupled with the drought conditions. In northern New York, there was more moisture, populations were greater, but damage was less apparent. Some yellowing of alfalfa was noted in NEW JERSEY and numbers on alfalfa in MARYLAND were about normal, with characteristic injury being noted in Carroll, Montgomery and Queen Annes Counties in the latter State. Populations of potato leafhopper in VIRGINIA were generally moderate from mid-July to late August, being most abundant in Nansemond and Surry Counties. Light to medium infestations were noted on alfalfa in several locations of the State in late July.

CLOVER LEAFHOPPER (Aceratagallia sanguinolenta) was the third most abundant leafhopper species in alfalfa in the eight MASSACHUSETTS counties surveyed in October, and the leafhopper was considered normal for the year in UTAH. PAINTED LEAFHOPPER (Endria inimica) was the most abundant leafhopper found in alfalfa surveyed during October in MASSACHUSETTS, and this species and SIX-SPOTTED LEAFHOPPER (Macrosteles fascifrons) were abundant on alfalfa in southern RHODE ISLAND. Also in MASSACHUSETTS, Errastumus ocellaris was conspicuously abundant for the first time in Berkshire County alfalfa, comprising 4.7 percent of all the leafhoppers present in the October survey. Several species of LEAFHOPPERS were active in small grains and alfalfa in OKLAHOMA from mid-February through early November, with the highest populations present in June, July and August.

LYGUS BUGS (Lygus spp.) were again a general pest of CALIFORNIA forage crops. Infestations of alfalfa were medium to heavy in the Dixon area of Solano County; medium in Santa Clara County, in the Borrego Valley (San Diego County); in Siskiyou County, in San Bernardino County, and on seed alfalfa in the Antelope Valley, Los Angeles County; light to medium in the Arvin-Wheeler areas of Kern County and in Butte County; and heavy on alfalfa in Stanislaus County. They also required controls on seed clover in Tehama County. Populations were above normal in Umapine area of Umatilla County, OREGON, by June 16. Controls were necessary through midseason and fall. In the Ontario-Adrian area of Oregon, lygus bugs required control in seed acreages. Counts of 10-12 per sweep were common in Malheur and Klamath Counties during August. Jackson County seed yields were lowered by lygus bug damage. In WASHINGTON, a reduced control problem on alfalfa raised for seed was noted during the cool 1962 season. Lygus hesperus and L. elisus were the dominant species. Overwintered adults of lygus bugs began appearing spottedly in Canyon County, IDAHO, in late March and, during April, low numbers were found in all alfalfa fields sampled in that area. By June 1, lygus bugs were common to abundant in alfalfa fields in southwestern Idaho, with counts of 10 per sweep noted in the Grandview area. Generally, lygus bugs remained at or below normal population levels during the summer.

Populations of lygus bugs in NEVADA were normal for the season, with periodic insecticide treatments required in alfalfa seed fields. However, heavy infestations were present in alfalfa throughout ARIZONA much of the year, and controls were required in some seed fields. Lygus bugs caused considerable damage in seed alfalfa fields in Chaves, Eddy and Dona Ana Counties, NEW MEXICO; and lygus bugs numbered 100-250 per 100 sweeps on alfalfa left for seed production in the Arkansas Valley of COLORADO, and an average of two applications of insecticides were applied to these fields.

TARNISHED PLANT BUG (Lygus lineolaris) was quite abundant on alfalfa in April and May in PENNSYLVANIA, but gradually tapered off toward the end of the season. In NEW YORK, the late spring populations of tarnished plant bug were slightly higher than those of 1961, with a peak number of 30 adults per 10 sweeps. The second population peak, which normally occurs in late July, was less than in 1961, with about 10 adults per 10 sweeps. Noticeable feeding was observed on legumes in VERMONT, and the species was one of the principal plant bugs on red clover and alfalfa near maturity in all sections of MARYLAND. It was very abundant in that State. Tarnished plant bug was present in clover and alfalfa in ILLINOIS in normal numbers, and above normal numbers were present in KANSAS, but damage appeared to be negligible in the latter State. In OKLAHOMA, light, scattered populations of tarnished plant bug first appeared in early February and activity continued into November. Populations began building up during May in alfalfa in all areas of the State, with 15-25 per 10 sweeps being common in most areas. Heaviest populations in Oklahoma occurred in the southeast, with counts up to 250 per 10 sweeps. Moderate to heavy populations continued in the southeast through August. Lighter counts were generally present in other areas of the State. Adult abundance of tarnished plant bug in NEBRASKA ranged from one to 15 per 10 sweeps throughout the State on legumes. High nymphal populations occurred in Saunders County during May. Adult activity was very noticeable on corn plants in the eastern area during the last week of November.

RAPID PLANT BUG (Adelphocoris rapidus) was one of the principal plant bugs on red clover and alfalfa near maturity in all sections of MARYLAND. It was very abundant in 1962 in Maryland and evident on alfalfa in PENNSYLVANIA. Populations on alfalfa and clover in ILLINOIS were normal. Nymphal counts of rapid plant bug averaged 40 per 10 sweeps in Saunders County, NEBRASKA, alfalfa in May. Adults averaged 4 per 10 sweeps on alfalfa throughout the season.

A movement of ALFALFA PLANT BUG (Adelphocoris lineolatus) to the southern portion of WYOMING was noted again in 1962. Populations were about the same as in 1961 except in Goshen, Platte, Converse and Fremont Counties, where larger populations were found in nearly all of the alfalfa fields. Only sporadic infestations were found in these same counties in 1961. Nymphal populations of alfalfa plant bug in NEBRASKA averaged 35 per 10 sweeps in Saunders County alfalfa in May. Elsewhere in Nebraska, populations were light throughout the season. More than normal numbers were present in KANSAS in 1962, but damage appeared to be negligible. Normal numbers were present in ILLINOIS and the pest did not reach economic proportions in NORTH DAKOTA.

Both tarnished plant bug and rapid plant bug were light in legumes in MISSOURI, and another PLANT BUG (Ilnacora stalii) was evident on alfalfa in PENNSYLVANIA. MEADOW PLANT BUG (Leptopterna dolabratus) was present in normal numbers in clover and alfalfa in ILLINOIS.

Heavy populations of STINK BUGS developed on alfalfa in Imperial County, CALIFORNIA, but they were reported light on legumes in MISSOURI.

ALFALFA WEEVIL (Hypera postica) was recorded in VERMONT for the first time in 1962. It was collected at Westminster and Bellows Falls, Windham County, and Pownal, Bennington County, on June 26. In MASSACHUSETTS, as many as 12 larvae and adults were collected per sweep in Berkshire County in May. Highest counts of fall survey included 14 adults and 27 larvae per 100 sweeps in Easton, Bristol County; 6 adults and 27 larvae in Southwick, Hampden County; and 3 adults and 10 larvae in Topsfield, Essex County. Counts in other counties of Massachusetts averaged fewer than 10 per 100 sweeps. Also, alfalfa weevil was collected during the year on Marthas Vineyard Island, Dukes County, which is off the southeast coast. This was the last uninfested area of the State. A survey of a field in South Kingstown, Washington County, RHODE ISLAND, on May 10 revealed adults, no larvae and a count of 5 egg masses per 60 stalks. Actively feeding larvae were found in this and other alfalfa in county by May 17. Between June 2 and June 22, the larval count per 100 sweeps in a South Kingstown field rose from 40 to 1,936. Populations of alfalfa weevil then subsided, but periodic checks through September continued to show a significant breeding population.

Alfalfa weevil caused more injury to alfalfa in NEW YORK during 1962 than in any previous year. In Dutchess County, the first larvae did not appear until early May, which is about 10 days later than normal. The peak of the larval population occurred in late May, when as many as 1,850 larvae were taken in 10 sweeps. By mid-June, nearly all of the larvae had pupated, the number of larvae remaining below 5 per 10 sweeps for the rest of the year. Alfalfa weevil is now found in all except four counties in PENNSYLVANIA, viz., Forest, Mercer, Venango and Crawford, all in the northwestern section of the State. Prolonged drought conditions this past spring and summer accentuated damage and accelerated development so that at the time of the first cutting the majority were pupae and adults, with only a few larvae present. Untreated fields were almost completely defoliated at cutting time and, in many instances, adults remained in the fields and fed on the developing bugs thus preventing any new growth for as long as four weeks after the first cutting. In NEW JERSEY, larval damage was reported heavy in untreated alfalfa in parts of the State in May. Populations had been very low in April. First and second-stage larvae were first noted on alfalfa in DELAWARE during the last week of March. Counts of spring-laid eggs reached 4.8 per stem in old growth by April 19 in south New Castle County. Feeding injury

remained light until late April in untreated fields and, by mid-July, injury in these fields was rather heavy. In MARYLAND, numbers of larvae were about normal and reached a peak in mid-May. Damage to untreated first-growth alfalfa ranged from moderate to heavy. Adults were also responsible for stunting second-growth alfalfa in several counties.

Alfalfa weevil continued to spread during 1962 to new areas in southeastern OHIO. It was found in 7 additional counties, making a total of 20 counties now known to be infested. Populations were low in most areas. A few fields known to be infested for several years had severe damage. Due to warm weather, most eggs hatched within a short period of time and most larvae matured in late May. In VIRGINIA, heavy statewide infestations of alfalfa weevil larvae were observed on untreated alfalfa, especially in areas in which this species appeared for the first time in 1962. New county records for the year were Buchanan,Dickenson, Lee, Scott and Wise. Sussex County is the sole county for which this species has not been officially recorded as being present. Adults of the weevil were common on beans and other crops in some areas of Virginia in late May and early June. For the first time in Virginia larvae caused damage to third and fourth cuttings of alfalfa. Light to medium infestations were encountered from early August through mid-October in several counties. Adults returned to fields and caused marginal leaf and stem damage in Bath and Montgomery Counties in late September.

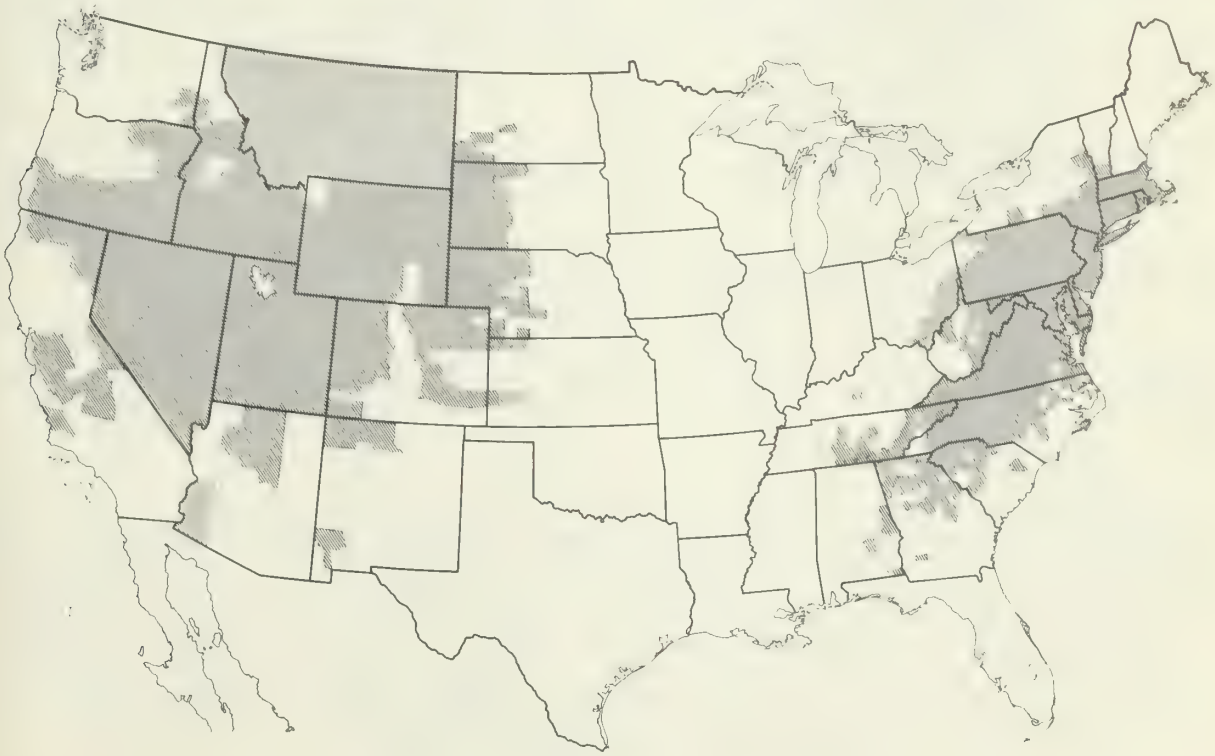
Peak emergence of alfalfa weevil adults in NORTH CAROLINA occurred the first week of May in the central Piedmont region. Unusually heavy damage occurred to alfalfa on the lower slopes of the mountains, 2,000 feet and under, in the Asheville-Hendersonville area. Much less damage occurred to alfalfa in SOUTH CAROLINA than in years past, which reflects control efforts. Alfalfa weevil infestations in GEORGIA were light to heavy. Fields treated with a recommended chlorinated hydrocarbon insecticide in the fall of 1961 had good control. Many fields which were treated with less than the recommended rate had poor control. Eggs, larvae and adults were present in alfalfa as early as February in Georgia. To a large degree, alfalfa weevil has contributed to the reduction of the acreage of alfalfa in Georgia. In 1959, when this insect was first found in the State, approximately 45,000 acres of alfalfa were being grown. The acreage at the end of 1962 was 25,000. Damage in ALABAMA was severe in the northern and central portions of the State. In many instances, first cuttings of alfalfa were lost where the populations were heavy. In TENNESSEE, larvae were appearing in the eastern and central third of the State in early March. At least 9 new counties were reported during the year. Treatments have been recommended over the entire infested area.

Alfalfa weevil was detected in four new KANSAS counties during 1962, all in the western area. They were Kearny, Rawlins, Decatur and Finney. Very light populations, approximately 1 per 10 sweeps, were present in Dundy County, NEBRASKA, and averaged 25 per 100 sweeps in Scotts Bluff County in June. In COLORADO, considerable variation occurred throughout the State in the amount of insect damage to alfalfa. The highest losses occurred in areas where growers failed to use an early application for control of alfalfa weevil, or weather conditions prevented such an application. The loss of alfalfa due to all insects varied from 1 to 16 percent. The alfalfa weevil caused the greatest amount of loss in Colorado to the first cutting in those areas where loss occurred, with larval populations ranging from 100 to 500 per 100 sweeps.

Alfalfa weevil was the most damaging crop pest during 1962 in WYOMING. Infestations were larger than in 1961. Possible resistance to recommended chemicals has been reported in Big Horn County. Heavy rainfall prevented control efforts in some areas of the State. In UTAH, control failures again occurred in the Smithfield-Richmond area of Cache County and in some other areas, as was the case in 1961. Over most of the State, spring treatments of certain chlorinated hydrocarbon insecticides continued to give effective control. Damage to the second crop, and even to the third-crop alfalfa, was the worst in the memory of some older farmers. The pest was considered to be more abundant than normal.

Alfalfa weevil continues to spread in MONTANA and is now a problem in most alfalfa-producing areas of the State. Severe damage has occurred this past year in Lincoln, Gallatin and Broadwater Counties. Control measures should be practiced wherever the weevil is present in Montana. For all practical purposes, the entire State should now be considered infested. In IDAHO, overwintered adults became noticeably active during early April. Egg laying was noted during late April and early May and first-stage larvae began appearing in the Lewiston area in mid-May, and by May 25 in the southwestern area. Larval feeding damage became severe by late June in many fields in the western and south central areas. Damage was particularly heavy in parts of Nez Perce, Owyhee, Canyon and Ada Counties.

Alfalfa weevil was moderately damaging in the eastern and southern OREGON counties. Klamath County losses were estimated at 5-7 percent, with most losses suffered in fields not receiving early season controls. Losses were in quality of first hay crop harvested. Damage was particularly evident along field edges. Adult populations observed in July and August indicated a serious potential for 1963. Crook County was recorded for the first time in 1962. In NEVADA, infestations of alfalfa weevil were heavier and damage more widespread than usual. Adult activity and egg laying began in the second and third weeks of March and extended into the first weeks of June. Larval development was normal, with peak populations present in mid-June. Pahranagat Valley, Lincoln County, Nevada, experienced its heaviest damage in several years, and heavy populations occurred in all counties except Clark. In some areas, recommended chemicals for adult control failed to give satisfactory results. Heavy populations developed during April in Siskiyou County, CALIFORNIA, alfalfa fields. Alfalfa weevil damaged alfalfa in San Juan County, NEW MEXICO, and larvae and adults were also found in alfalfa fields near Chama, Rio Arriba County.



Distribution of Alfalfa Weevil

Heavy infestations of an ALFALFA WEEVIL (Hypera brunneipennis) damaged alfalfa on the Yuma Mesa in Yuma County, ARIZONA, during February, March and early April. Infestations were also heavier than usual in the Yuma and Gila Valleys, but damage was not generally heavy. In CALIFORNIA, local, light populations of this weevil developed in Orange, San Bernardino and Riverside Counties, and areas of San Diego and Imperial Counties had fairly heavy populations of the insect.

Populations of CLOVER LEAF WEEVIL (Hypera punctata) in ILLINOIS were higher in early April of 1962 than at any time since 1954. Approximately 8,154 acres of clover were treated. Populations became noticeable in southwestern WISCONSIN and extensive damage occurred in a few fields. Very low populations were observed on alfalfa and red clover throughout MISSOURI during the early spring. The only visible damage in the State was to a few red clover fields in the southwest area. In KANSAS, larvae and adults of clover leaf weevil were present in large numbers in alfalfa over most of the State but, with a few exceptions, were not of economic importance. Larval activity in NEBRASKA was commonly observed during April in the eastern area on sweetclover. The pest caused noticeable damage to forage crops in local areas of TEXAS, but was not widespread. Clover leaf weevil was considered about normal for the year in UTAH and IDAHO. Medium populations developed early in the year on alfalfa in the Scott and Shasta Valleys of Siskiyou County, CALIFORNIA.

Adults of LESSER CLOVER LEAF WEEVIL (Hypera nigrirostris) were abundant in a field of red clover in Worcester County, MARYLAND, in September and early October. Larvae caused conspicuous injury to the axils and buds of first-growth red clover in most sections of Maryland. Larvae infested 50-100 (average 87) percent of the red clover stems in the southeast and southwest districts of ILLINOIS May 6-11. Two fields which had 100 percent of the stems infested had 33 and 48 percent, respectively, of the terminal buds severely damaged or killed. Lesser clover leaf weevil extended its range in LOUISIANA, but still has not appeared in appreciable numbers west of the Mississippi River. The weevil was not severe in OHIO, but it was present in damaging numbers in the southern area. Adults averaged 4 per 10 sweeps in the southern area of NEBRASKA and 10 per 10 sweeps in the southeast area of the same State in June and July. About normal numbers of the weevil were present in IDAHO.

CLOVER HEAD WEEVIL (Hypera meles) populations were heavy on white and crimson clovers throughout LOUISIANA. Losses in seed yields ranged from 40 to 75 percent in untreated fields.

CLOVER ROOT CURCULIO (Sitona hispidula) was more numerous in alfalfa in MASSACHUSETTS during the fall survey than in 1961. It represented 41.6 percent of all beetles in this crop. Larvae were responsible for scarring roots in 12 acres of alfalfa in Frederick County, MARYLAND, and low numbers occurred in MISSOURI during the year. The pest was not of economic importance during 1962 in KANSAS and about normal numbers were present in UTAH and IDAHO. Adults averaged one per 10 sweeps on beans in the eastern area of NEBRASKA during September. Light populations occurred on alfalfa in the Fowler area of Fresno County, CALIFORNIA.

SWEETCLOVER WEEVIL (Sitona cylindricollis) was collected for the first time in NEW MEXICO on sweetclover at Regina, Rio Arriba County. The weevil was considered to be below normal for the year in UTAH, but larger populations were found in WYOMING than in 1961 and 1960. Increases in the amount of sweetclover occurred in all areas of Wyoming, which may account for the increases in weevil population. In NEBRASKA, moderate populations caused noticeable damage to seedling sweetclover in the eastern half of the State from April to July. Counts ranged from 3 per 100 sweeps during the daytime to 406 per 100 sweeps at night. About normal numbers were present in IDAHO, and Ferry County, WASHINGTON, was found infested for the first time. A WEEVIL (Sitona scissifrons) averaged 14 adults per 10 sweeps in Stanton County, NEBRASKA, alfalfa in September.

CLOVER SEED WEEVIL (Miccotrogus picirostris) was found for the first time in Clark and Will Counties, ILLINOIS, during 1962, and in MARYLAND. In IDAHO, prolonged, cool spring weather apparently extended the period of emergence of adults from hibernation throughout the west central area. Peak concentrations of clover seed weevil adults in white and alsike clovers occurred during the first week of July, with 20 per sweep commonly recorded along field margins. Examination of maturing seed heads during early July revealed larvae in all stages of development. In WASHINGTON, the brown bloom development was 13 days later, and the first weevil migration into fields was 20 days later than in 1961, in white clover seed fields in Asotin County. Farmers had difficulty with timing of their control programs, often ending up with two ineffective treatments.

CLOVER ROOT BORER (Hylastinus obscurus) was much in evidence in some areas of PENNSYLVANIA in 1962. In one large field of first-year clover, most of the plants were dead or wilted before cutting. The first adults of the season in ILLINOIS were collected in La Salle County on May 16. This was also a new county record. In WISCONSIN, a localized infestation of clover root borer occurred in the Arlington area (Columbia County) and severe injury resulted to fields of clover. VETCH BRUCHID (Bruchus brachialis) caused its usual amount of damage to seed vetch in TEXAS.

BLISTER BEETLES were about normal for the year in UTAH and very low numbers were present on alfalfa in KANSAS. Lytta cyanipennis became locally abundant in IDAHO and caused spotted damage to some alfalfa and clover fields in Bonner County during mid-June. Populations of ASH-GRAY BLISTER BEETLE (Epicauta fabricii) were heavy on alfalfa and sweetclover in some NORTH DAKOTA fields, and Epicauta sp. averaged 22 per 10 sweeps on alfalfa in Lancaster County, NEBRASKA, in September. Small isolated spots of alfalfa and soybeans were damaged by Epicauta sp. in MISSOURI during the dry period of August; and BLACK BLISTER BEETLE (E. pennsylvanica), MARGINED BLISTER BEETLE (E. pestifera) and Epicauta sp. were present in alfalfa fields in many areas of ILLINOIS in late July and August. In INDIANA, a pronounced increase of Epicauta spp. was observed in alfalfa. The 1962 population, coupled with a high grasshopper year, indicates a potential for a large population in 1963.

BEAN LEAF BEETLE (Cerotoma trifurcata) adults ranged 3 to 10 per sweep on legumes in the eastern area of NEBRASKA. Light populations of a FLEA BEETLE (Systena taeniata) developed in clover plantings in the Galt area of Sacramento County, CALIFORNIA. Also in California, light, larval populations of an ELATERID BEETLE (Cardiophorus sp.) were reported infesting alfalfa in the Reedley area of Fresno County, and required treatments on blackeye peas in the Arlington area of Riverside County. JAPANESE BEETLE (Popillia japonica) adults were occasionally reported as feeding on alfalfa in VIRGINIA, but they caused only negligible damage.

SALT-MARSH CATERPILLAR (Estigmene acrea) was light to medium on alfalfa locally in Orange County, CALIFORNIA, in 1962.

CORN EARWORM (Heliothis zea) was generally lighter than in the past two years on white and crimson clovers in LOUISIANA, although a few spotty infestations caused moderate damage in some areas. Also, this species, in conjunction with beet armyworm (Spodoptera exigua), caused serious damage to alfalfa in the Red River Valley area of Louisiana near Shreveport in late September and October. In OKLAHOMA, heavy populations of 40-75 corn earworm larvae per 10 sweeps were again found in late September in some south central areas where they damaged alfalfa. Moderate, scattered counts of 8-10 per 10 sweeps were noted as late as mid-October in alfalfa in Garfield County. Green vetch pods in the northeast vetch-growing areas of TEXAS were damaged considerably during May and early June by corn earworm, and controls were applied in several instances.

ALFALFA LOOPER (Autographa californica) adult and larval activity was extreme in Umatilla County, OREGON, alfalfa acreages from mid-May, and the pest was light to medium on alfalfa in Yolo County, CALIFORNIA. An extremely heavy

infestation was present in many alfalfa fields in Yellowstone, Carbon, Big Horn and Stillwater Counties, MONTANA. Adults began appearing in large numbers in light traps at Twin Falls, IDAHO, in early June. By late June and early July, larvae were extremely abundant in Idaho alfalfa fields, particularly in the south central and southeastern areas, frequently causing 10 days to 2 weeks delay in the second cutting of hay. Larval counts of up to 12 per square yard were often encountered in the State. Alfalfa looper was a serious pest during the spring in UTAH, but damage decreased markedly about the time hot summer weather arrived. The insect was considered more abundant/or damaging than normal in 1962 in Utah. Infestations and damage were heavy in northern NEVADA. Infestations varied from light to heavy in the central and northern counties in July, with some seed alfalfa fields being severely damaged. Alfalfa looper was not a problem in 1961 in WYOMING, but large numbers appeared the latter part of July in the Big Horn Basin in 1962. Moderate to severe damage was caused to alfalfa. When controls were applied to alfalfa, the loopers moved into adjoining sugar beet fields, causing light damage. The looper was present on alfalfa in COLORADO, but populations of economic importance did not develop.

CABBAGE LOOPER (*Trichoplusia ni*) was generally only light on alfalfa in OKLAHOMA from mid-May to late June.

GREEN CLOVERWORM (*Plathypena scabra*) larvae ranged from light to moderate on alfalfa during July and August in most sections of MARYLAND, and were common on alfalfa in Sussex County, DELAWARE, during early September. Low numbers were reported feeding on legumes in MISSOURI. It was first observed on clover and alfalfa in southern ILLINOIS on May 9. Populations were low throughout the season in Illinois, MINNESOTA and KANSAS. In OKLAHOMA, light populations of green cloverworm were first observed in late February in the southeast on alfalfa. Activity continued until early November, with the peak activity observed the week of September 22 when counts of 50-125 per 10 sweeps were noted in Bryan and Carter Counties.

BEET ARMYWORM (*Spodoptera exigua*) was light on alfalfa in Yolo County, CALIFORNIA, and noneconomic in KANSAS. However, beet armyworm caused damage to alfalfa in the Brazos-Burleson County area of TEXAS and light damage in several north central counties of the same State. In addition, this species, in conjunction with corn earworm (*Heliothis zea*), was heavy and caused serious damage to alfalfa in the Red River Valley area of LOUISIANA near Shreveport in late September and October.

WESTERN YELLOW-STRIPED ARMYWORM (*Prodenia praefica*) adult flights peaked in the Milton-Freewater area of OREGON blacklight trap collections between July 17-28. Larval infestations appeared in Umatilla County alfalfa fields in mid-August, with populations observed along edges of fields averaging 6 per square yard over several hundred acres. This type of infestation also occurred in Malheur and Baker Counties, Oregon. Infestations varied from light to heavy in NEVADA, with heavy damage occurring in northern Washoe County alfalfa. Light to medium infestations were present on alfalfa in Butte, Kern and Fresno Counties, CALIFORNIA. Below-average numbers were encountered in UTAH in 1962. YELLOW-STRIPED ARMYWORM (*P. ornithogalli*) damage in Utah has been generally local, being below normal in larger alfalfa seed-growing areas of the State.

VARIEGATED CUTWORM (*Peridroma saucia*) populations on white and crimson clovers were generally lighter than in the last two years in LOUISIANA, although a few spotty infestations caused moderate damage in some areas. In MISSOURI, light infestations were reported in legumes in the southeast, central and northeast areas, but very little damage resulted. The insect was not of economic importance in KANSAS in 1962. Variegated cutworm severely damaged alfalfa in Elko and Eureka Counties, NEVADA, and caused light damage in Lander County, same State. In CALIFORNIA, medium to heavy populations were present in alfalfa in Escondido-Cajon area of San Diego County and light on the same crop in Orange County. Unspecified CUTWORMS damaged newly seeded alfalfa in 2 VIRGINIA counties.

A CLOVER BUD CATERPILLAR (Grapholitha conversana) appeared at about normal population levels in west central IDAHO during 1962.

ALFALFA CATERPILLAR (Colias eurytheme) damaged alfalfa in September and October in some areas of Graham and Yuma Counties, ARIZONA. Populations were generally heavier than normal statewide. Infestations in NEW MEXICO were heavier than usual on alfalfa statewide. Damage was evident in many fields throughout the summer months. Normal numbers were present in UTAH. In CALIFORNIA, the species was light on alfalfa in eastern Fresno County, medium in Yolo County and light in the Coachella Valley, Riverside County. Alfalfa caterpillar severely damaged an alfalfafield in Clark County, WASHINGTON; and feeding damage appeared in alfalfa in Payette County, IDAHO, with populations largely second instars by June 1. During late June in Idaho, numbers averaged one larva per stem in alfalfa in Camas County and continued abundant in that area of the State through early July. Adult alfalfa caterpillar activity was very evident in NEBRASKA legume fields; larval counts averaged 26 per 10 sweeps in Lancaster County alfalfa in September. The insect was present on alfalfa in COLORADO, but it did not become economic. In OKLAHOMA, the first alfalfa caterpillar activity was noted on alfalfa in late April, and activity continued until mid-October. Generally, light populations existed throughout the season in Oklahoma, with very little damage attributed to this species. Light infestations were widely distributed on alfalfa in TEXAS, but it was generally noneconomic. However, vetch in Harris County was heavily damaged in late October by this pest. Alfalfa caterpillar populations on alfalfa and clover in all sections of MARYLAND during the season were generally light.

GARDEN WEBWORM (Loxostege similalis) became active in OKLAHOMA in early June and continued until early December in the south central area. However, only light populations existed in alfalfa, with some localized damage being reported in Kingfisher and Blaine Counties in late August. In TEXAS, the webworm caused noticeable forage damage in local areas, but was not widespread. Heavy flights of adults were observed in central and northern MISSOURI the first week of July. Damage to alfalfa in the central area was light, and spots in the northeast showed moderate to heavy damage following these flights of moths. ALFALFA WEBWORM (L. commixtalis) appeared during August in local areas of Burleson County, TEXAS, and Loxostege spp. caused minor damage to alfalfa in the eastern area of KANSAS. Unspecified WEBWORMS damaged 60 acres of alfalfa in SOUTH CAROLINA.

AN ALFALFA SEED CHALCID (Bruchophagus roddi) was found for the first time in NEVADA'S major seed-producing area of Humboldt County. Below-normal numbers were present this year in UTAH. A CLOVER SEED CHALCID (B. platyptera) developed in clover fields in the Galt area of Sacramento County, CALIFORNIA.

THRIPS infestations on alfalfa were generally light to moderate in NEVADA, but heavy infestations occurred in Clark, Lincoln and Nye Counties in April and in Humboldt County in July. In CALIFORNIA, thrips populations were heavy on alfalfa in Monterey County.

A SNOWY TREE CRICKET (Oecanthus sp.) was common on alfalfa throughout the northern half of ILLINOIS in late August. In CALIFORNIA, FIELD CRICKETS (Gryllus spp.) ranged light to fairly heavy in alfalfa plantings in Imperial County and light in fields in San Benito County.

MITES in general were not active in most locations of CALIFORNIA until April. In seed alfalfa in the Imperial Valley, Imperial County, heavy populations developed in April. SPIDER MITE (Tetranychus spp.) infestations in NEVADA were generally light on alfalfa and red clover, except in Humboldt County where heavy infestations severely defoliated red clover in July and assisted in defoliating seed alfalfa in October. TWO-SPOTTED SPIDER MITE (Tetranychus telarius) was of concern in Jackson County, OREGON, to alfalfa seed growers from early June to harvest. Controls were necessary from July to prevent the devitalization of plants. In IDAHO, two-spotted spider mite reportedly became abundant

in alfalfa fields at Nampa and Homedale in late May. Otherwise, populations remained generally low in alfalfa and clovers during the growing season. STRAWBERRY SPIDER MITE (T. atlanticus) seriously injured red clover in Caroline, Harford and Queen Annes Counties, MARYLAND, in 1962.

Several insects were reported causing damage to beans grown for forage in CALIFORNIA. ALFALFA LOOPER (Autographa californica) was light to medium in Santa Clara County; CORN EARWORM (Heliothis zea) medium in Butte County, needed controls in Tehama County and medium in Merced County; SALT-MARSH CATERPILLAR (Estigmene acrea) generally medium in Monterey County and Santa Cruz County and medium to heavy in Santa Clara County. Corn earworm persisted in many locations of the State late in 1962. LYGUS BUGS (Lygus spp.) were heavy in Butte and Orange Counties; BEAN APHID (Aphis fabae) was light to medium in Merced and Orange Counties; and THRIPS were medium in Monterey and Yolo Counties and light in Riverside County.

Lawn, Pasture and Rangeland Insects

Highlights:

FALL ARMYWORM was in outbreak proportions in Texas and Louisiana and heavy in several other Southern States. Damage to pastures and lawns was rather heavy. SOD WEBWORMS (Crambus spp.) were abundant in lawns in Ohio, Indiana, Illinois, and parts of Kansas, Nebraska and Colorado. RANGE CATERPILLAR was a major pest of rangeland in New Mexico. Larvae denuded large sections of land in an area of Colfax County. JAPANESE BEETLE, GREEN JUNE BEETLE and other WHITE GRUBS were a problem on turf in several states. CHINCH BUGS caused considerable damage to St. Augustine grass in the South, and to turf in Connecticut and Ohio. A WHEATGRASS BUG (Labops hesperius) was recorded for the first time in Arizona. RANGE CRANE FLY was a pest in California for the second season in many years. A BERMUDA GRASS MITE (Aceria neocynodonis) was recorded for the first time in Florida and Georgia, and the mite continued to cause damage to Bermuda grass in areas of New Mexico, Arizona and Nevada.

FALL ARMYWORM (Laphygma frugiperda) began to build up in TEXAS in the northeast area during late August and, by November 10, had spread over the eastern two-thirds of the State to an approximate line running from Childress to Del Rio. Heavy damage to pastures, grasses and lawns was commonly reported from throughout the area. This outbreak was comparable to the 1960 outbreak and considerably heavier than in 1961. In LOUISIANA, fall armyworm appeared early in the season and developed populations of outbreak proportions in some areas. Untreated pastures and hay meadows were severely damaged in many areas. Infestations in ARKANSAS were heavier in 1962 than in 1961, but not so heavy as in 1960. It was most prevalent in pastures in the southern area of the State during the fall. Fall armyworm was locally destructive in MISSISSIPPI. Damage in ALABAMA was rather severe in the southern and central portions of the State. Extremely dry weather, coupled with this insect problem, caused serious reductions in pasture and hay products in 1962. Heavy infestations remained active until cold weather. Light to heavy infestations of fall armyworm were present on Bermuda grass in GEORGIA, but the threat to this crop in SOUTH CAROLINA did not materialize.

SOD WEBWORMS (Crambus spp.) caused local damage to lawns in VIRGINIA, MARYLAND and DELAWARE. Adults were commonly in flight at night in Kingston area of Washington County, RHODE ISLAND, in August. In OHIO, C. trisectus was abundant throughout the State and particularly destructive to much turf in the south central

section of the State. Crambus spp. were much more abundant in INDIANA than for several years, doing extensive damage to lawns and turf throughout the State. Economically, sod webworms are one of the most important groups of insects of the year in Indiana. They were also abundant and caused more damage to lawns in ILLINOIS than they have caused for many years, especially in the central and east districts. Damage to lawns in eastern NEBRASKA was also very noticeable and unspecified species caused damage to lawns and turf in some areas of COLORADO. Crambus spp. caused severe injury in KANSAS and, in many instances, completely destroyed blue grass lawns in the eastern area. Hot, dry weather in May favored large damaging populations early in the summer in Kansas. In WASHINGTON, sod webworms, especially C. topiarius, are building up and causing damage as turf and grass seed production acreage is increasing in the Columbia Basin.

Other WEBWORMS (Acrolophus spp.) were found causing considerable injury to lawns locally in VIRGINIA, MARYLAND and ILLINOIS. GRANULATE CUTWORM (Feltia subterranea) damaged Bermuda grass lawns in the Odessa area of western TEXAS; and BRONZED CUTWORM (Nephelodes emmedonia) caused occasional, local damage to lawns in VIRGINIA.

RANGE CATERPILLAR (Hemileuca oliviae) eggs began to hatch in NEW MEXICO in June. The infestation was much more widespread than in 1961 in the State. Heavy populations severely damaged rangeland grasses in Farley-Abbott area, Colfax County, and small areas in Union and Harding Counties. It continued to spread in the northern area of New Mexico. SAGEBRUSH DEFOLIATOR (Aroga websteri) became epidemic on sagebrush and bitterbrush in brushlands of Modoc County, CALIFORNIA, causing complete defoliation of brouse plants in the area, but populations and damage by this pest were generally below normal for the year in UTAH. Larvae, probably MOMPHID or GELECHIID MOTHS, heavily damaged roots of Astragalus sp., a potentially useful native legume, in ALASKA.

JAPANESE BEETLE (Popillia japonica) was the most common turf insect in the eastern half of OHIO despite the fact that the population was less than in 1961. Larvae, or grubs, caused occasional, local damage to lawns in VIRGINIA, and there were more instances than usual of grub damage to blue grass in the western part of PENNSYLVANIA. Almost complete destruction of some Pennsylvania fields was observed. Japanese beetle was scarce in CONNECTICUT, except in localized areas where some heavy infestations were noted in turf. Japanese beetle grubs caused damage to isolated lawns and to a watershed in Scituate, Providence County, RHODE ISLAND. In most cases, however, ASIATIC GARDEN BEETLE (Maladera castanea) and WHITE GRUBS (Phyllophaga spp.) were found in association with the Japanese beetle infestations in Rhode Island. WHITE GRUBS (Phyllophaga spp.) were abundant throughout OHIO and caused considerable damage to turf, particularly in the south central section. Light to heavy infestations were also present in lawns in the northern area of GEORGIA; and some lawn turfs in certain east central counties of TEXAS and areas of COLORADO were damaged. In NEBRASKA, damaging populations of all stages of Phyllophaga anxia, ranging from 2 to 30 per square foot and ranging in depth from 2 to 18 inches, were present in wet meadows in the northern sandhills. In addition, spotted larval infestations of a CHAFER (Cyclocephala sp.) caused damage to blue grass lawns in Lancaster County, Nebraska.

GREEN JUNE BEETLE (Cotinis nitida) grubs caused more damage than usual in the western part of PENNSYLVANIA to blue grass; almost complete destruction of some fields was observed. The pest was abundant and active locally in a ladino clover field in Wicomico County, MARYLAND, and in a pasture in Kent County, same State. Grubs infested pastures in 2 VIRGINIA counties and occasionally damaged lawns in the State. Light to heavy green June beetle infestations were present in northern GEORGIA lawns, and the pest continued heavy on some golf courses in northwestern ARKANSAS. In the latter case, however, some golf course managers feel that the species is beneficial.

NORTHERN MASKED CHAFER (Cyclocephala borealis) was abundant throughout OHIO and particularly destructive to much turf in the south central area. During late June and early July, adults of northern masked chafer were again extremely abundant at dusk and about lights in sections of Prince Georges County, MARYLAND.

Square foot soil samples taken in Wayne, Ontario and Onondaga Counties, NEW YORK, for third-stage larvae of EUROPEAN CHAFER (Amphimallon majalis) revealed low numbers (an average of about 3 per square foot) to be present, as has been the case for the past four years.

Heavy infestations of a CERAMBYCID (Derobrachus brevicollis) were present on 200 acres of Bahia grass in Miller County, GEORGIA. This insect is known to be present in Seminole, Miller and Dougherty Counties, Georgia. A BILLBUG (Sphenophorus sp.) was present in small numbers in lawns in Pershing County, NEVADA.

A ST. AUGUSTINE GRASS CHINCH BUG (Blissus leucopterus insularis) severely damaged many lawns in TEXAS from Corpus Christi to Beaumont along the coast, into the eastern area and as far north as Dallas. The bug caused serious damage to St. Augustine grass lawns throughout LOUISIANA and continued to damage lawns, especially St. Augustine grass, in many sections of MISSISSIPPI. Relatively more damage is continually being caused each year in the north central part of Mississippi. Infestations in GEORGIA were moderate to heavy on St. Augustine grass. Moderate to heavy infestations are common from year to year. Damage in FLORIDA continued as usual. The bug also damaged lawns in Charleston and in the Piedmont area of SOUTH CAROLINA all summer.

HAIRY CHINCH BUG (Blissus leucopterus hirtus) was abundant throughout OHIO, particularly in the south central section where much turf was damaged. It was also abundant in CONNECTICUT during the fall season, especially in the southwestern lower tier of towns, where many lawns were heavily infested. FALSE CHINCH BUGS (Nysius spp.) were general in grassland in Sonoma County, CALIFORNIA.

A WHEATGRASS BUG (Labops hesperius) infested intermediate wheatgrass plantings in the Weiser area of IDAHO during May. In WYOMING, one very severe infestation was found damaging wheat strips that bordered soil bank lands in Goshen County. The wheat strips were very severely damaged. Control efforts were successful in decreasing the population and in stopping further damage. Several infestations were present on range areas, but little damage was present. Population levels of the bug on crested wheatgrass in COLORADO made it necessary to consider the use of controls in Park and Rio Grande Counties. L. hesperius was found for the first time in ARIZONA during the year. It was collected on intermediate wheatgrass in Coconino County. A PACIFIC GRASS BUG (Thyrillus pacificus) - First report of damage in the Columbia Basin Project of WASHINGTON on crested wheatgrass.

Light to heavy infestations of a SPITTLEBUG (Prosapia bicincta) were present on Bermuda grass pastures in GEORGIA, with most infestations being light to moderate. Infestations on lawns were light to heavy, with most being light to moderate. In SOUTH CAROLINA, unspecified species of SPITTLEBUGS caused damage to coastal Bermuda grass in trace amounts.

Large populations of a CICADA (Okanagana luteobasilis) occurred on range in many areas of WYOMING, mainly in the western half. No crop damage was reported.

RHODES-GRASS SCALE (Antonina graminis) was a serious pest of Bermuda grass lawns in the Las Cruces area of Dona Ana County, NEW MEXICO. Another SCALE INSECT, probably Odonaspis ruthae, appeared in heavy, localized infestations in Bermuda grass lawns in the Fort Worth area of TEXAS.

Light populations of RANGE CRANE FLY (Tipula simplex) developed in alfalfa plantings in Siskiyou County, CALIFORNIA. Severe damage, requiring treatment, occurred in the Exeter area of Tulare County on rangelands. This crane fly was also a problem in foothill areas in Fresno, Mendocino and Marin Counties. This was the second season of the range crane fly being a pest in California in many years. Also in California, FRIT FLY (Oscinella frit) developed to heavy proportions in local golf courses in San Diego County. Other areas of California where infestations were heavy in 1961 were not affected during the 1962 season. In addition, a SOD FLY (Metoponia rubriceps) infested lawns in the South San Francisco area of San Mateo County. MARCH FLIES (Philia spp.) became a problem in a sod area in Los Angeles County during November.

HARVESTER ANTS (Pogonomyrmex barbatus and P. occidentalis) were present in about normal numbers in UTAH, and SOUTHERN FIRE ANT (Solenopsis xyloni) was common in lawns in east central TEXAS.

A BERMUDA GRASS MITE (Aceria neocynodonis) was collected at Patrick Air Force Base, Brevard County, FLORIDA, on April 18, 1962, on Bermuda grass. This constitutes the first record for the Eastern United States. It is now found in Florida in scattered locations from Cocoa Beach, Brevard County, to Miami, Dade County. The eriophyid mite was also found for the first time in GEORGIA during 1962. The collection was made from Bermuda grass in Tift County. In NEW MEXICO, infestations of the mite were widespread in Bermuda grass lawns in Las Cruces area of Dona Ana County, and in the Carlsbad area of Eddy County. Damage was severe where it was not controlled. Populations in ARIZONA damaged Bermuda grass lawns and pastures throughout the Bermuda-growing season. Infestation in Bermuda grass in Clark County, NEVADA, increased. In CALIFORNIA, the mite showed a slight northward spread, but was not commercially important during 1962.

A complex of MITES, Galumna nervosum, Amblyseus sp. and Zygoribatula sp., damaged lawn grasses, principally Bermuda grass, in the Midland-Odessa vicinity of TEXAS.

A BUD MITE (Aceria paracalifornicus) occurred as heavy populations on Artemisia californica in the Gustine area of Merced County, CALIFORNIA. Sage in most parts of the State fared very poorly from drought and insects/mites during 1962.

Heavy populations of an undetermined SLUG damaged clover pastures in the Point Ryes area of Marin County, CALIFORNIA.

Soybean and Peanut Insects

Highlights:

LESSER CORNSTALK BORER was more severe than previous years in Georgia and was of major importance in Alabama. Losses to peanuts were estimated at $2,209,245.00 in Georgia and in the millions in Alabama. Infestations of CORN EARWORM on soybeans in eastern Virginia were more widespread and heavier than during the two previous years. An outbreak of corn earworm was noted on soybeans in southeast Arkansas and heavy infestations were present in northeast Louisiana. SOUTHERN CORN ROOTWORM was a major problem in several southwest Georgia counties and damage to untreated peanuts in Virginia ranged from noneconomic to quite heavy. MEXICAN BEAN BEETLE was the major pest of soybeans in South Carolina and Virginia, and BEAN LEAF BEETLE continues to be an important pest of soybeans in North Carolina. Damage by bean leaf beetle was also noted in Virginia and Maryland. THRIPS infestations on Virginia peanuts were the heaviest in the past 10 years.

LESSER CORNSTALK BORER (Elasmopalpus lignosellus) infestations were more severe than in previous years in GEORGIA. County agents estimate a loss of $2,209,245.00 to peanuts from damage caused by this pest. Infestations were heavy on a number of crops including soybeans, southern peas, beans and tomatoes. This insect infested 156,314 of the 238,025 acres of peanuts grown in Georgia. Damage ranged from light to 90 percent of the crop. In ALABAMA, heavy populations caused millions of dollars of damage to peanuts and soybeans in the southern and central portions of the State. Dry weather conditions were also very conducive to the tremendous buildup of this pest. Several peanut yields were reduced as much as 90 percent due to the presence of lesser cornstalk borer. The borer caused unusually heavy damage during 1962 in MISSISSIPPI. Specimens were collected from field peas and other crops. The species was the principal pest of peanuts in TEXAS in 1962. Heavy damage occurred in the Waco area, central section, and in Colorado, Frio and Atascosa Counties.

CORN EARWORM (Heliothis zea) injury to soybeans in DELAWARE was evident only in the late-planted fields during late September when larvae were rather abundant. During September, outbreak numbers infested foliage and pods of late soybeans on the lower Eastern Shore of MARYLAND; damage was heaviest in Wicomico County. Infestations of soybeans in eastern VIRGINIA were more widespread and heavier than during the two previous years. Light infestations first appeared on August 16 in Charles City and New Kent Counties. Light to heavy infestations were reported from several localities on soybeans. Corn earworm was light on both fruit and seed of soybeans in SOUTH CAROLINA, but locally serious in some fields. Infestations on peanuts in GEORGIA were light to moderate and lighter than in previous years. Infestations on soybeans in that State were light to heavy, with most being light to moderate. Corn earworm caused some damage to soybeans throughout most of ALABAMA. In ARKANSAS, about 40 fields in the southeast were surveyed weekly. Inventory data were obtained, in addition to data on seasonal buildup. These data permitted detection of an outbreak on soybeans as it developed. Although confined mainly to 6 counties, the outbreak was heavy in 5 Arkansas counties and resulted in nearly one-half the acreage in these counties being treated. A special survey was conducted for the fourth consecutive year on the early season egg deposition on soybeans. (See CEIR 13(7):109-112). Heavy corn earworm infestations developed on soybeans in LOUISIANA during September and October in the alluvial areas of the northeast. Serious damage occurred in many untreated fields. In TEXAS, peanut foliage in the Frio-Atascosa County and Hill-McLennan County areas was severely "ragged" during late July. Foliage feeding by this species was also heavy on peanuts in Montague, Parker and Fannin Counties (north central).

GREEN CLOVERWORM (Plathypena scabra) larvae ranged from light to moderate on soybeans during July and August in most sections of MARYLAND, and very light populations were present in soybean fields examined the latter half of September in NORTH CAROLINA. The insect was present on soybeans in SOUTH CAROLINA in its usual numbers, and very common, but noneconomic, on soybeans in ARKANSAS. Disease was important in holding down infestations in the latter State. Green cloverworm was first observed on soybeans in ILLINOIS in the west-southwest district on June 12. Populations were low throughout the season, however.

FALL ARMYWORM (Laphygma frugiperda) infestations on peanuts in GEORGIA were light to moderate and lighter than in previous years. It was also light on soybeans in Charles City and New Kent Counties, VIRGINIA, in mid-August. YELLOW-STRIPED ARMYWORM (Prodenia ornithogalli) caused some "ragging" of peanut foliage in the north central area of TEXAS. CABBAGE LOOPER (Trichoplusia ni) infestations on soybeans in GEORGIA were light to heavy, with most being light to moderate; and cabbage looper was light in soybean fields examined the latter half of September in NORTH CAROLINA. GRANULATE CUTWORM (Feltia subterranea) infestations on GEORGIA peanuts were light to moderate. Infestations were general over the peanut-growing area in that State, but with less defoliation than in the past. Unspecified CUTWORMS caused unusually heavy damage to peanuts

locally in SOUTH CAROLINA; other fields in the area were not affected. VELVETBEAN CATERPILLAR (Anticarsia gemmatalis) caused some damage to soybeans throughout most areas of ALABAMA and infestations of peanuts in GEORGIA were light to moderate and lighter than in previous years. Infestations of soybeans in the latter State were light to heavy, with most being light to moderate. Velvetbean caterpillar attacks on soybeans in SOUTH CAROLINA were light and late and were very light in NORTH CAROLINA.

RED-NECKED PEANUTWORM (Stegasta basqueella) was present on peanuts in OKLAHOMA and light to moderate infestations were present in GEORGIA. GARDEN WEBWORM (Loxostege similalis) became active in early June in OKLAHOMA and continued until early December in the south central area. Heavy populations were reported defoliating soybeans in the Vinita area of Craig County in mid-July.

Summer-long collections of STINK BUGS on soybeans in ARKANSAS showed that GREEN STINK BUG (Acrosternum hilare) is by far the most important species in that State. SOUTHERN GREEN STINK BUG (Nezara viridula) and BROWN STINK BUG (Euschistus servus) were of lesser importance on soybeans in Arkansas. Southern green stink bug is more common in southeast Arkansas than in other areas. Southern green stink bug and brown stink bug populations on soybeans in LOUISIANA were lighter than during the last several years. Southern green stink bug caused some damage to soybeans throughout most of ALABAMA. In NORTH CAROLINA, undetermined STINK BUGS averaged 5 adults and 11.7 nymphs per 50 feet of row in soybean fields in central coastal counties during the week of September 17. Part of these fields resurveyed during the second week of October. Populations had declined approximately 40 percent by that time. Eleven of the fields which had initially averaged 24.6 stink bugs per 50 feet of row sustained an average of 2.5 percent damage. Soybeans in the other eastern areas of North Carolina averaged from 6 to 15 stink bugs per 50 feet of row during late September and early October.

A BURROWING STINK BUG (Pangaeus bilineatus) infested peanuts in GEORGIA at about the same degree as in recent years, with the exception of 1959 when this insect was a serious pest in several counties. THREE-CORNERED ALFALFA HOPPER (Spissistilus festinus) damage was noted to soybeans in 3 widely separated locations of SOUTH CAROLINA; and it was observed on peanutvines in Montague County, TEXAS, but no damage was evident. All stages of a WHITEFLY (Trialeurodes sp.) were abundant in many soybean fields on the Eastern Shore of MARYLAND.

SOUTHERN CORN ROOTWORM (Diabrotica undecimpunctata howardi) was a major problem on peanuts in several southwest GEORGIA counties. The acreage infested was approximately that of 1961 (3,500 acres). Infestations ranged from light to heavy. As of the end of the year in Georgia, this pest had not been found on peanuts outside the southwest area. In NORTH CAROLINA, adults of southern corn rootworm began moving into peanut fields in Bertie and Gates Counties about July 20, which was almost 2 weeks later than the previous year. Infestations and damage were not as severe as in 1961, probably because of dry conditions during the egg-laying period. In VIRGINIA, approximately 60,000 acres of a total of 104,000 acres of peanuts were successfully treated. Effects of infestation in untreated fields ranged from no injury to quite heavy damage.

MEXICAN BEAN BEETLE (Epilachna varivestis) infestations in GEORGIA soybeans were light to heavy, with most being light to moderate. Mexican bean beetle was the major pest of soybeans in SOUTH CAROLINA in 1962. It caused heavy, localized damage to foliage. In NORTH CAROLINA, larvae and adults of the beetle fed on soybeans from June to September in the east central part of the State. This insect is generally not a serious problem in North Carolina at the present time, but it may become more important on soybeans, particularly in the east central area. Feeding was generally not noticeable on soybeans in other areas of North Carolina. Mexican bean beetle heavily infested soybeans in several counties in eastern VIRGINIA in August and September. Infestations and damage were heavier than any other time in recent years. In MARYLAND, the pest caused light to moderate injury to soybeans on the Eastern Shore and in southern Maryland.

BEAN LEAF BEETLE (Cerotoma trifurcata) continued to be an important pest of soybeans in NORTH CAROLINA. It fed on newly emerging soybeans in late May and also caused some pod damage later in the season. In VIRGINIA, medium to heavy infestations of soybeans were reported in several counties. Adults were common again in MARYLAND, and caused conspicuous foliage injury to soybeans on the Eastern Shore. Bean leaf beetle was present in most ARKANSAS soybean fields, but was noneconomic. Low numbers were found feeding in MISSOURI. Populations were again low in the south central district of MINNESOTA, and a slight buildup during July caused some damage to soybeans in NEBRASKA.

Adults of a LEAF BEETLE (Maecolaspis sp.) were first observed on soybeans in ILLINOIS on June 12. Populations went as high as 0-80 (average 32.5) per 100 sweeps in soybeans and 20-100 (average 57.5) per 100 sweeps in clover in the west-southwest district in late June, but little damage was done.

TOBACCO WIREWORM (Conoderus vespertinus) larvae damaged 50 to 75 percent of a stand of emerging peanuts in a 3-acre field in Greene County, NORTH CAROLINA, around the first of May. Some lessening of stand due to wireworms was noted in a few locations in Bertie County and may have also occurred elsewhere in the State.

JAPANESE BEETLE (Popillia japonica) adults caused noticeable feeding injury to soybeans during July in some areas of DELAWARE. One infestation in Newton and Benton Counties, INDIANA, occurs in a rural area where the adults feed on the foliage of smartweed and soybeans. Although the infested area on the Indiana side of the State line is some 180,000 acres, heavy populations of Japanese beetle occur only over 2,000 acres. Losses to soybeans from beetles feeding on the foliage have run as high as 33 percent in some fields. A WHITE GRUB (Phyllophaga hirticula) damaged soybeans in Burt County, NEBRASKA, during August and September; larvae averaged 8 per row foot.

THRIPS infestations were light to heavy on peanuts in GEORGIA, but most infestations were light to moderate. Infestations in Georgia were comparable with those of 1961, but lighter than in previous years. Damage to peanuts in SOUTH CAROLINA was the same as usual. In VIRGINIA, the heaviest infestation for the past 10 years occurred on peanut seedlings, especially in Southampton and Sussex Counties. Thrips also heavily infested several large soybean fields in Essex, Mathews and Northumberland Counties, Virginia, in late June. In MARYLAND, thrips damaged soybeans during the spring and summer. SPIDER MITES were general and heavy on peanuts in GEORGIA late in the season throughout the peanut-growing area of the State. STRAWBERRY SPIDER MITE (Tetranychus atlanticus) and some other spider mites caused noticeable injury to several soybean fields in Queen Annes, Talbot and Wicomico Counties, MARYLAND, in 1962.

Extensive surveys for SOYBEAN CYST NEMATODE (Heterodera glycines) throughout the soybean-producing States have confirmed infestations on more than 70,000 acres in nine States (Arkansas, Illinois, Kentucky, Mississippi, Missouri, North Carolina, South Carolina, Tennessee and Virginia). The total infested acreage is estimated at more than 350,000. (Estimate was based on a careful study of the pattern of proven infestations). During 1962, surveys were conducted in 25 States on more than one and one-half million acres. New infestations were confirmed on 10,500 acres. The destructive potential of soybean cyst nematode was observed during the 1962 crop season in several localities in the States of TENNESSEE, NORTH CAROLINA, MISSOURI and ARKANSAS. The nematode is most troublesome in those areas where soybeans are grown continuously without rotation.

Flax, Sunflower, Mustard and Safflower Insects

Highlights:

DIAMONDBACK MOTH caused economic damage to cultivated mustard in parts of North Dakota and Montana.

CORN ROOTWORM (Diabrotica spp.) adults were observed feeding on sunflower heads in SOUTH DAKOTA during the late summer; counts were up to 20 per blossom. Larvae of a FLEA BEETLE (Systena frontalis) were found feeding on the underground parts of flax near Northwood, NORTH DAKOTA.

DIAMONDBACK MOTH (Plutella maculipennis) was a problem on cultivated mustard in the north central section of NORTH DAKOTA in 1962. A number of economic infestations were observed. Larvae were observed working on the foliage and pods of plants. Most reports came from the north central section of the State. In MONTANA, extremely large adult flights were observed during 1962, and infestations were heavy on most mustard plantings both west and east of the Continental Divide. Insecticidal controls were applied to approximately 20,000 acres of mustard.

In Imperial County, CALIFORNIA, VARIEGATED CUTWORM (Peridroma saucia) was heavy on flax, while CABBAGE LOOPER (Trichoplusia ni) and BEET ARMYWORM (Spodoptera exigua) were both light on the same crop. In northeastern Kings County, California, SUNFLOWER MOTH (Homoeosoma electellum) caused as much as 50 percent damage to sunflowers. FOXGLOVE APHID (Acyrthosiphon (Myzus) solani) populations were trace on safflower and flax in Fresno County, California; and PLANT BUGS (Lygus spp.) ranged from light to medium on safflower in Butte County, same State.

TURNIP MAGGOT (Hylemya floralis) severely damaged bird rape (Brassica campestris) at Matanuska Station, ALASKA. This crop is being grown for evaluation as an oilseed crop.

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